

NIIH MedlinePlus®

Winter 2011

Trusted Health Information
from the National
Institutes of Health

UNITED STATES
NATIONAL
LIBRARY OF
MEDICINE
NATIONAL INSTITUTES OF HEALTH



the magazine

Plus, in this issue!

- **Sickle Cell Disease**
What to know
- **You CAN Quit Smoking**
Here's how
- **To Stay "Flu-Safe" This Winter, See Inside**
Help stop the flu

Despite osteoporosis,
Cloris Leachman
goes "Dancing with the Stars"



The Challenge of

Osteoporosis and Brittle Bones

The National Library of Medicine 175 Years of Information Innovation

In 1836, physicians had only their own experience and a general textbook or two to guide them in treating people. That germs caused infection was unknown, lead was recommended for cholera, and average life expectancy for both men and women was less than 40 years!

Today, thanks to the National Library of Medicine, virtually any bit of information ever discovered about the human body, condition, or disease is available at a keystroke to anyone, anywhere. MedlinePlus (www.medlineplus.gov) carries information on more than 800 health topics alone, for example. And we are all much healthier for it.

We begin our celebration of the Library's 175th anniversary on page 26, with an introduction by Donald A.B. Lindberg, M.D., Director of the National Library of Medicine, to some of the Library's outstanding, recent contributions.

In coming issues of *NIH MedlinePlus* magazine, we will highlight other significant milestones in the Library's longstanding mission to acquire, organize, and disseminate health-related information for the betterment of American—and global—human health.

Our cover story in this issue, starting on page 10, features Cloris Leachman, who shares her secrets about how to avoid osteoporosis and brittle bones. And for some practical tips on how you and your family can stay "flu-safe" this winter, turn to page 22.

For a really healthy start to 2011, there is no better place for smokers and their families to look for help than our section on quitting tobacco—smoking and chewing (smokeless)—which begins on page 4.

We hope you find this issue of the magazine both informative and useful.

Sincerely,
Donald West King, M.D., Chairman
Friends of the National Library of Medicine



Photo: NLM

Donald West King, M.D.
FNLN Chairman

Let Us Hear From You!

We want your feedback on the magazine, ideas for future issues, as well as questions and suggestions. E-mail your letters to Managing Editor Selby Bateman (selby.bateman@vitality.com) or send mail to Editor, *NIH MedlinePlus* Magazine, P.O. Box 18427, Greensboro, NC 27419-8427. We will feature some of your letters in upcoming issues.

Help Out for Health: Be a Friend

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

If you or your company can help to support and expand the publication and distribution of *NIH MedlinePlus* magazine, thousands and thousands more people will gain valuable, free access to the world's best online medical library, www.medlineplus.gov.

For more information, please visit www.fnlm.org or call (202) 679-9930. Or, write to FNLN, 7900 Wisconsin Avenue, Suite 200, Bethesda, MD 20814.

The FNLN is classified as a 501(c)(3) nonprofit organization for federal tax purposes. Web site: www.fnlm.org

Mobile MedlinePlus!

On the go! Find trusted health information from the experts at MedlinePlus and the National Library of Medicine:

- Disease and wellness topics
- The latest health news
- An illustrated medical encyclopedia
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The National Institutes of Health (NIH)—the Nation's Medical Research Agency—includes 27 Institutes and Centers and is a component of the U.S. Department of Health and Human Services. It is the primary federal agency for conducting and supporting basic, clinical, and translational medical research, and it investigates the causes, treatments, and cures for both common and rare diseases. For more information about NIH and its programs, visit www.nih.gov.

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From NIH Director Dr. Francis S. Collins

Mobile Technology and Health Care

Mobile health, or mHealth for short, uses mobile technologies for health research and healthcare delivery. At last November's annual mHealth Summit, held at the Walter E. Washington Convention Center in Washington, D.C., Francis S. Collins, M.D., Ph.D., Director of the National Institutes of Health, talked with *NIH MedlinePlus* magazine about the impact of cell phone technologies on global health.

What does the explosion in cell phones mean to people's better health?

The marriage of mobile technologies and applications is a growing opportunity. NIH grants for mobile phone related research have been rising rapidly, thanks to the American Reinvestment and Recovery Act (ARRA). There were about 150 awards in 2010, and we expect these numbers to grow. Most of NIH's 27 institutes and centers have significant investments in this area; some more than others, but all moving quite rapidly.

Where are the largest investments in the new technologies?

The largest are in mobile phone and "tele-health." The National Library of Medicine has been a prime mover in getting adequate, well-validated health information in front of the public through their various Web sites and information resources, such as Medline and MedlinePlus. Last year, NLM launched a mobile format, called Mobile MedlinePlus, in English and Spanish. (Go to <http://m.medlineplus.gov>.)



What does Mobile MedlinePlus offer the public?

Users have instant access to summaries of over 800 diseases, conditions, and wellness issues; a full medical encyclopedia; lots of diagrams, images, and pictures; drug information; news stories; a medical dictionary; and a powerful search engine. It is a mobile optimized Web site, accessible from any platform, including basic flip phones, iPhones, and Androids. That's just one of the concrete ways we are trying to bring medical information to the public.

What else is in the pipeline?

One of the more interesting gadgets is a wearable chemical sensor system to assess, in real time, a person's exposure to potentially health-threatening levels of hydrocarbon and acid vapors during emergencies. The sensor's readings can be transmitted through a cell phone connection to a receiving laboratory for immediate analysis. The system is also useful in wide-scale environmental disasters. During the Gulf oil spill, for example, researchers used the sensor to successfully track and measure levels of leaking oil at varying depths over significant distances.



“Many opportunities to improve health very much depend upon cell phone technologies, since cell phones are so rapidly expanding in many parts of the world that otherwise don’t have much access to communication.”

How about something someone can use at home?

There is a novel one in the works, a small lapel button that combines a tiny video camera, microphone, GPS connection, and accelerometer to assess the health consequences of diet and exercise. It transmits by cell phone a person’s actual dietary and physical activity to a dietician for evaluation. Rather than people reporting what they wished they had done, the system objectively records what they actually did eat, how many miles they really did walk.

Do you believe these new technologies can help to control the global threat from new and old diseases?

Global health is one of the five themes that I’ve identified as particularly important for investment. Many opportunities to improve health very much depend upon cell phone technologies, since cell phones are so rapidly expanding in many parts of the world that otherwise don’t have much access to communication.

Is there a specific you can point to?

Yes, a microscope not much bigger than a quarter that doesn’t require a lens and can be connected to a cell phone to transmit high quality images of cells—information that would normally

be very hard to acquire. It comes from UCLA and is being tested for its application to assess infectious disease—HIV in this case. It transmits images to a remote computer that can automatically interpret them. It’s highly valuable in following the course of infected individuals who are far from the nearest medical center.

Another, also about HIV monitoring, is basically a pill holder that sends a signal every time it is opened. A lapse in opening the box undoubtedly means there’s been a lapse in taking the pills. Since the data are submitted to a clinic, efforts can then be made to contact the patient, or the health worker, to make sure treatment gets back on track.

What are your immediate plans for expanding health information by cell phone?

We recognize there is great growing interest in the field. But, especially for early-stage investigators, there may not be an easy way to be mentored and trained by experts. So, this coming summer, NIH will be running an institute on mobile technology for 25 junior investigators. It will run for five days, cover all aspects of the emerging discipline, and be managed by the NIH office of Behavioral and Social Science Research, with a variety of other partners.

You Can Here's How Quit Smoking



Like most smokers who want to quit, Andrew Plumer, 43, didn't succeed the first time he tried. But he kept trying. A reference librarian at the National Library of Medicine since 2004, Plumer is now a nonsmoker.

Why and when did you start smoking?

When I was 19. I was in college, and it was the cool thing to do.

Why did you want to quit?

I was getting older—and getting winded after chasing after my son. I constantly had colds. Plus, it was expensive!

How many times have you tried to quit?

I tried seriously at least a half-dozen times. The length of time I was smoke free ranged from two to three weeks up to six months. But when my stress level increased, I would start smoking again. This time, I did something I read about: try to quit when you're doing something out of the ordinary. So, I quit when my wife and I went to Italy. I couldn't smoke on the flight, and when we got there we were so busy doing things that it made it easier not to think about smoking.

What methods have you used to try to quit?

I've tried lots of ways: cold turkey, nicotine patch, nicotine gum, and Zyban (bupropion) both with the patch and without. I didn't like the nicotine gum very much, but this time I used nicotine lozenges, and they worked. It was still tough. I felt nervous and got headaches. But I was determined to do it this time, once and for all.

How long have you quit this time?

Since April 2006, and I haven't lapsed!

What benefits do you see from quitting?

I lowered my blood pressure, and I can exercise more. I can walk up the Metro (subway) escalator steps and just feel like I'm getting a good workout instead of gasping for breath. My family is happy, too.

Many workplaces, restaurants, and other public buildings and areas in the United States now prohibit smoking—in part because of the dangers of secondhand smoke. But Andrew Plumer didn't wait for that reason to finally stop. After years of trying, he successfully quit in April 2006, and has been smoke free ever since.

5 Steps to **START**

The National Cancer Institute recommends that these five steps be a part of every successful plan to quit smoking:

S	Set a quit date.
T	Tell family, friends, and coworkers you plan to quit.
A	Anticipate and plan for the challenges you will face while quitting.
R	Remove cigarettes and other tobacco products from your home, car, and workplace.
T	Talk to your doctor about getting help to quit.

FASTFACTS

- **Cigarette smoking** is an addiction. Tobacco contains nicotine, an addictive substance that makes quitting difficult.
- **Smoking** is the leading cause of preventable death in the United States. More than 440,000 Americans die of smoking-related illnesses every year.
- **Some 38,000 deaths** are caused by exposure to secondhand smoke.
- **Smokers** are up to six times more likely to have a heart attack than nonsmokers. Smoking can also cause chronic obstructive pulmonary (lung) disease (C.O.P.D.), including bronchitis and emphysema, as well as numerous forms of cancer.
- **Quitting smoking**, also called smoking cessation, will greatly reduce your risk of developing and dying from cancer, improve circulation, lower your heart rate and blood pressure, and enhance your sense of taste and smell, as well as a number of other health benefits.
- **While quitting** can be difficult, there are many products, services, and organizations available to help you stop smoking. Medications can help with cravings and withdrawal. Professionals, such as your healthcare provider and pharmacist, can offer advice.

Quitting Is Hard

Many ex-smokers say quitting was the hardest thing they ever did.

Do you feel hooked? You're probably addicted to nicotine.

Nicotine is in all tobacco products. It makes you feel calm and satisfied, yet also alert and focused. But the more you smoke, the more nicotine you need to feel good. Soon, you don't feel "normal" without nicotine. This is nicotine addiction.

It takes time to break free from nicotine addiction. It may take more than one try to quit for good. So, don't give up too soon. You will feel good again.

Another reason that quitting is hard for most smokers is because smoking is a big part of their lives. You may enjoy holding a cigarette and puffing on it. You may smoke when you are stressed, bored, or angry. You may light up when you drink coffee or alcohol, talk on the phone, drive, or are with other smokers. After months and years, smoking has become part of your daily routine. You may light up without even thinking about it.

You may try to quit several times before you're finally done with cigarettes. But you will learn something each time you try. It takes willpower and strength to beat your addiction to nicotine.

Remember, millions of people have quit smoking for good. You can be one of them.

Free Counseling to Help You Quit

Free one-to-one counseling is available over the phone by calling the National Cancer Institute's Smoking Quitline (1-877-44U-Quit).

Keep Trying!

Quitting was not easy for Becca Mendelson. But it was worth it.



Photo: Becca Mendelson

Becca Mendelson

Becca Mendelson was born in Washington, D.C., and grew up in Northern Virginia. She earned a writing degree from the University of Pittsburgh. Becca currently lives on the island of St. Croix in the U.S. Virgin Islands and works as a classic rock DJ.

Why did you start smoking?

I started smoking when I was 18. I was past the peer pressure age, but my boyfriend smoked, and smoking was part of the whole college atmosphere. I smoked about half a pack to a pack a day.

Why did you want to quit?

My mom got cancer. I was coming home for Thanksgiving. I was going to be in airports and airplanes with no smoking, no one smoked at home, and I didn't want to smoke around my mom. It was the perfect time to quit.

Benefits of Quitting

- **20 minutes after quitting:** Your heart rate drops.
- **12 hours after quitting:** The carbon monoxide level in your blood returns to normal.
- **2 weeks to 3 months after quitting:** Your heart attack risk begins to drop, and lung function improves.
- **1 to 9 months after quitting:** Your coughing and shortness of breath decrease.
- **1 year after quitting:** Your added risk of coronary heart disease is half that of a smoker's.
- **5 years after quitting:** Your stroke risk is reduced to that of a nonsmoker's.
- **10 years after quitting:** Your lung cancer death rate is about half that of a smoker's.
- **15 years after quitting:** Your risk of coronary heart disease returns to normal.

How many times have you tried to quit?

Probably once a year for the last 10 years. I once quit for over a year when I was getting ready to join the Peace Corps. But when that fell through, I moved to St. Croix and became a bartender. In that environment, it was easy to start again.

What methods have you used to try to quit?

This time I went cold turkey. I have felt annoyed at times, but it's not unbearable. I have tried the patch previously, but didn't like the side effects.

What benefits do you see from quitting?

Well, I don't smell like smoke, and it's definitely healthier. I no longer have a deep raspy voice.

How long have you quit this time?

Two weeks! And when I go back to St. Croix, I won't be bartending, so I won't be surrounded by smokers. I think that will help!

To Find Out More

Additional information is available at:

- **MedlinePlus:** www.nlm.nih.gov/medlineplus/smoking.html.
- **National Cancer Institute:** www.smokefree.gov—science-driven tools, information, and support for anyone trying to stop smoking.
- **National Institute of Dental and Craniofacial Research:** a guide for quitting smokeless tobacco. www.nidcr.nih.gov/OralHealth/Topics/SmokelessTobacco/SmokelessTobaccoAGuideforQuitting.htm.
- **National Institute on Drug Abuse:** <http://smoking.drugabuse.gov/> includes information on treating tobacco use and nicotine addiction for adults and teens.

Secondhand Smoke Kills

Research shows that even a little secondhand smoke exposure is dangerous.

Secondhand smoke comes from a burning tobacco product and from the smoke exhaled by smokers. Secondhand smoke is also called environmental tobacco smoke, involuntary smoking, and passive smoking. Secondhand smoke contains at least 250 toxic chemicals, including more than 50 that can cause cancer.

Nonsmokers who breathe secondhand smoke may:

- Develop cancer or heart disease
- Have breathing problems

- Get colds and the flu more easily
- Die younger than people who don't breathe secondhand smoke
- Pregnant women who breathe secondhand smoke may give birth to low-weight babies and/or have babies who are more likely to die of sudden infant death syndrome (SIDS)
- Children who breathe secondhand smoke may have breathing problems, such as asthma; get more ear infections; and develop more lung infections, such as pneumonia

Source: Centers for Disease Control and Prevention

“Light” Tobacco = Heavy Health Risks

Federal law restricts the words “light,” “low,” and “mild” from tobacco products in the U.S. market, and health officials continue to warn there is no such thing as a safe cigarette.

Under the 2009 Family Smoking Prevention and Tobacco Control Act, a tobacco company can't use the words “light,” “low,” and “mild” on any cigarette products, unless the U.S. Food and Drug Administration (FDA) has issued an order allowing it—and that hasn't happened.

Manufacturers had until June 22, 2010, to stop labeling cigarettes then on the market as “light,” “low,” and “mild.” Then, they had another month to distribute already produced cigarettes. Leftover stocks with the restricted words may be sold until they are depleted.

Corinne Husten, M.D., M.P.H., FDA senior medical advisor on tobacco issues, says that prohibiting the words “light,” “low,” and “mild” should help debunk the myth that low-tar cigarettes are less harmful than other cigarettes.

“These terms imply that the products are safer,” says Husten. “However, studies clearly show that the consumer can get just as much nicotine and tar from these cigarettes as ‘regular’ cigarettes.”

Smokeless Tobacco: “Chew” and Snuff Are Killers, Too

What is Smokeless Tobacco?

Smokeless tobacco is tobacco that is not burned. It is also known as chewing tobacco, oral tobacco, spit or spitting tobacco, dip, chew, snuff, and snus. Most people chew or suck

(dip) the tobacco in their mouths and spit out the tobacco juices that build up, although “spitless” smokeless tobacco has also been developed. Chewing tobacco comes as loose leaves of tobacco, as plug tobacco (brick form), or in a twist form. Snuff is finely ground (powdered) tobacco that is sold moist or dry, in tea bag-like pouches or sachets. No matter what it's called, smokeless tobacco is addictive and can harm your health.

Here's why: Smokeless tobacco is still tobacco. Tobacco contains cancer-causing chemicals, including nitrosamines, a family of chemicals that has been strongly linked to cancer.

- Like cigarettes, smokeless tobacco also contains nicotine—an addictive drug. Holding an average-size dip in the mouth for just 30 minutes can deliver as much nicotine as smoking three cigarettes. Nicotine addiction can make quitting difficult.
- Smokeless tobacco causes mouth cancer, pancreatic cancer, and other health problems, such as gum disease.



Photo: iStock

Tips for Quitting

Quitting smokeless tobacco is not easy. The most effective way to quit using smokeless tobacco is to have a quit date and a quitting plan. Successful quitters also include support teams in their plans—friends, family, and co-workers who can help during the difficult times when urges and temptations are strongest.

To learn more about smokeless tobacco and oral health, please see *Smokeless Tobacco: A Guide for Quitting* (www.nidcr.nih.gov/OralHealth/Topics/SmokelessTobacco/SmokelessTobaccoAGuideforQuitting.htm)

—Source: National Institute of Dental and Craniofacial Research

3 Tools to Help You Quit

Know your triggers

Understanding what triggers the urge to smoke can give you a head start on quitting. In the box to the right, check off all those situations that trigger your craving for a cigarette.

Think about what might tempt you to smoke. Many smokers find that all these triggers make them want to smoke. You may only check a few. The point is to recognize all the situations that trigger your craving for a cigarette.

- Waking in the morning
- Drinking coffee, tea, or alcohol
- Smelling a cigarette
- Being with other smokers
- Seeing someone smoke
- Taking a break
- Talking on the phone
- Checking email
- Surfing the Internet
- Watching TV
- Driving my car
- Being a passenger
- After eating
- After having sex
- After completing a task
- Feeling stressed
- Feeling lonely or depressed
- Being or feeling less tolerant
- Feeling bored
- Feeling angry, irritable, or impatient

Meet your triggers head on

You can prepare to quit smoking by thinking of ways to avoid some triggers and creating alternatives for others. The urge to smoke does subside. Resisting is easier if you:

- take a deep breath
- keep your hands busy—write, doodle, or hold a coin or pencil
- put something else in your mouth, such as a toothpick, sugar-free lollipop, or celery stick
- go places where smoking isn't allowed, such as a library or nonsmoking restaurant
- hang out with people who don't smoke
- avoid or reduce alcoholic drinks; try to drink water or juice instead

Keep a journal

To understand your short- and long-term challenges, start by examining your smoking habits. Track how many cigarettes you smoke a day and what you are doing when you light up.

Look for patterns. You may discover triggers you weren't aware of. Smoking at certain times or in varying circumstances may be more important than others. Understanding what tempts you and when can help control the urge to smoke.

Whether you use the format at right or one of your own, keep your journal handy. Write down where and when you smoke and what you're feeling, thinking, and doing. Keep track for at least one week, recording at least one full weekday and one weekend day. You may even find the time you spend writing has meant less time smoking.

—Source: National Cancer Institute

I will deal with my triggers by

Photo: iStock

Cigarette Number	Time of Day	Craving Level	Activity	Who I Was With	Mood
Example	10:45	3	At work	Alone	Stressed
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Free Guide Helps You Quit

The National Cancer Institute (NCI) offers a free, 38-page guide—*Clearing the Air: Quit Smoking Today*—to help smokers take the right steps to quit successfully. Included in the guide are helpful tools and strategies, including:

- A nicotine addiction test to determine how much you depend on nicotine
- A checklist of smoking triggers to help you understand the addiction
- A sample smoking journal to record your smoking habits
- Information on how to set a Quit Date
- A quitting worksheet
- Strategies to help avoid slips and ways to have a healthier lifestyle

A PDF of the guide can be downloaded from www.cancer.gov. Enter “Clearing the Air” in the Search box. Or, call 1-800-4-CANCER (1-800-422-6237) for a printed guide.

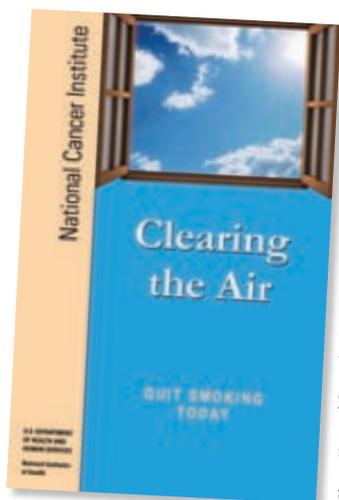


Photo: National Cancer Institute

Latest NIH Research

- Many factors contribute to a person's learning to smoke, continuing to smoke, and having difficulty quitting. There is a connection between genetics and nicotine addiction. Researchers have found that variations in specific genes substantially increase the risk of addiction, affect susceptibility to adverse health effects, and signal whether smoking cessation medications will help. This research someday may lead to better nicotine addiction treatment.
- Large smoking cessation trials suggest that women may have more difficulty quitting and be less likely to quit than men. The reasons are not well understood. Overall, women may experience withdrawal differently. Or, available medications may not work as well for them.
- Research indicates that some women may possibly be more concerned about gaining weight than other women. Gaining weight is common after quitting smoking, although most people do not gain that much. Therapy can help to ease these concerns and the pressure of quitting. Also, smoking cessation medications may ease anxiety because they can help to limit weight gains. More exercise and watching what you eat also can reduce weight.
- In November 2010, the NCI's National Lung Screening Trial (NLST) reported initial results from the trial, which compared two ways of detecting lung cancer: low-dose helical computed tomography (CT) and standard chest X-ray. The results showed 20 percent fewer lung cancer deaths among trial participants screened with low-dose CT compared to those who got screened with chest X-rays.

Ask Your Health Professional

1. What ways might help me to quit smoking?
2. Should I try a quit smoking medication?
3. If so, which would be best?
4. What are the side effects of such medications?
5. What challenges can I expect when I quit?
6. How will quitting improve my health?
7. What resources or programs are available?

Clinical Trials Related to Smoking

Clinical trials are scientific studies that try to find better ways to prevent, screen for, diagnose, or treat disease. You can find information about clinical trials related to smoking by going to www.clinicaltrials.gov and typing in the words you want to search, such as smoking or tobacco.

You may also be interested in prevention trials:

Clinical Trials: Lung Cancer Prevention

Check for trials about lung cancer prevention from NCI's List of Cancer Clinical Trials now accepting patients. <http://www.cancer.gov/search/ResultsClinicalTrials.aspx?protocolsearchid=475994>

Don't Let Osteoporosis Slow You Down

Cloris Leachman leads by example

When millions of Americans tuned in to see *Dancing with the Stars* in September 2008, they saw a familiar face as a contestant: Cloris Leachman—then an 82-year-old award-winning actress and comedian.

Over the following weeks, they were delighted to find out that this talented octogenarian could really dance. Leachman—winner of nine Emmys, a Golden Globe, and an Oscar—has never let anything stop her from doing what she loves, and she wasn't about to let osteoporosis keep her off the dance floor.

It's that kind of spirit that led the National Osteoporosis Foundation (NOF) to honor her recently for living strong with osteoporosis. Leachman has also testified at hearings before the U.S. Congress on behalf of the Foundation and the U.S. Office on Women's Health's "Best Bones Forever" osteoporosis educational campaign.

NIH *MedlinePlus* magazine's Peter Reinecke spoke to Leachman about her approach to osteoporosis.



Cloris Leachman and Corky Ballas get a kick out of *Dancing with the Stars* in 2008.

Photo: Cloris Leachman

In your new autobiography, *Cloris*, you mention that you have osteoporosis and asthma. Yet, at age 82 you were a big hit on *Dancing With The Stars*. Now you are starring in the new hit series *Raising Hope*. What do you do to keep in the kind of physical shape necessary for such demanding physical activity? How do you keep up your energy?

I remember what good shape I was in 15 years ago! Seriously, I'm a bucket of noodles right now. For me right now, rest is key. I get my down pillows and get real comfortable and think about how great it would be if I could exercise. I had a knee operation last December, and as soon as I've completed my rehabilitation I think I'll be a lot better.

When and how did you discover you had osteoporosis? Had you had symptoms? What did your health professional tell you to do?

Several years ago my doctor gave me the diagnosis after a bone density test. In looking back before then, I had broken a few bones—like my foot—just minor indications.

Research has clearly shown that it's important to start early building and maintaining healthy bones. What is your message to young people about osteoporosis?

I thought I was immune, so when I found I had it, I couldn't believe it. It is the last thing I would have imagined I'd have.

So I would say get educated. Ask questions. Pay attention to your health. And get tested.

Your active lifestyle is a wonderful role model for millions of women who live with osteoporosis. What message do you have for women who are living with osteoporosis? Do you have a philosophy about dealing with osteoporosis?

You really have to educate yourself. It is just crucial to your health and, therefore, your happiness. Just keep learning. It is always going to make you happier and healthier.

I should have been dead by now, but I am not because I paid attention. I always wanted to be healthy. Even if I didn't know how to do it in my earlier years, I've grown to learn about it. You've got to keep learning. It is a lifelong journey.

Do you have a healthy diet?

I eat really well. Everything I eat is fresh, colorful, and delicious.

You have had a remarkable career – you've won an Oscar and more Emmy Awards than anyone else. What does the future hold for Cloris Leachman?

I have my new series, *Raising Hope*. It's a lot of fun. They asked me what I'd want to do after *Dancing with the Stars*. I said I want to be on *American Idol*, the singing contest show. But we checked into it, and they said you had to be 28 or younger. Maybe we should take them to court for age discrimination!

Preventing and Treating Brittle Bones and Osteoporosis

In the United States today, more than 40 million people either already have osteoporosis or are at high risk due to low bone mass.

Bone and Bone Loss

Bone is living, growing tissue. It is made mostly of *collagen*, a protein that provides a soft framework, and calcium phosphate, a mineral that strengthens and hardens the framework.

Collagen and calcium combine to make bone flexible, strong, and able to withstand stress. The bones and teeth contain more than 99 percent of the body's calcium. The remaining 1 percent is found in the blood.

Throughout life, old bone is removed and new bone is added to the skeleton. During childhood and teenage years, new bone is added faster than old bone is removed. As a result, bones become larger, heavier, and denser. Around age 30, bone loss slowly begins to exceed bone formation.

Women lose bone fastest in the first few years after menopause, then more slowly. Osteoporosis develops when bone is lost too quickly or replaced too slowly.

FASTFACTS

- **Osteoporosis** weakens the bones, making them more likely to break. People with osteoporosis most often break bones in the hip, spine, or wrist.
- **Although osteoporosis** can occur at any age, it is most common in older women. Eighty percent of Americans with osteoporosis are women.
- **To keep your bones strong** and slow bone loss, eat a diet rich in calcium and vitamin D, exercise regularly, and do not drink alcohol in excess or smoke.

New Recommended Daily Amounts of Calcium and Vitamin D

Life Stage Group	Calcium Recommended Dietary Allowance (mg/day)	Vitamin D Recommended Dietary Allowance (IU/day)
Infants 0 to 6 months	*	**
Infants 6 to 12 months	*	**
1–3 years old	700	**
4–8 years old	1,000	600
9–13 years old	1,300	600
14–18 years old	1,300	600
19–30 years old	1,000	600
31–50 years old	1,000	600
51–70 years old	1,000	600
51–70 year old females	1,200	600
71+ years old	1,200	800
14–18 years old, pregnant/lactating	1,300	600
19–50 years old, pregnant/lactating	1,000	600

* For infants, adequate intake is 200 mg/day for 0 to 6 months of age and 260 mg/day for 6 to 12 months of age.
 ** For infants, adequate intake is 400 IU/day for 0 to 6 months of age and 400 IU/day for 6 to 12 months of age.

—Source: Institute of Medicine, December 2010



Photo: iStock

Risk Factors

There are many risk factors for bone loss and osteoporosis. Some of these things you cannot change and others you can.

Risk factors you cannot change include:

- **Gender:** Women develop osteoporosis more often than men.
- **Age:** The older you are, the greater your risk of osteoporosis.
- **Body size:** Small, thin women are at greater risk.
- **Ethnicity:** White and Asian women are at highest risk. Black and Hispanic women have a lower risk.
- **Family history:** Osteoporosis tends to run in families. If a family member has osteoporosis or breaks a bone, there is a greater chance that you will, too.

Risk factors you can change include lifestyle activities, eating habits, and hormonal levels that can change with age. Work with

your health professional to find out how best to prevent the following risk factors:

- **Sex hormones:** Low estrogen levels due to missing menstrual periods or to menopause can cause osteoporosis in women. Low testosterone levels can bring on osteoporosis in men.
- **Anorexia nervosa:** This eating disorder can lead to osteoporosis.
- **Calcium and vitamin D intake:** A diet low in calcium and vitamin D makes you more prone to bone loss.
- **Medication use:** Some medicines increase the risk of osteoporosis.
- **Activity level:** Lack of exercise or long-term bed rest can cause weak bones.
- **Smoking:** Tobacco is bad for the bones, heart, and lungs.
- **Drinking alcohol:** Too much alcohol can cause bone loss and broken bones.

Prevention

Nutrition

A diet rich in calcium and vitamin D helps make your bones strong. Many people get less than half the calcium they need. Good sources of calcium are:

- Low-fat milk, yogurt, and cheese
- Foods with added calcium such as orange juice, cereals, and breads

Vitamin D is needed for strong bones. Your body makes vitamin D in the skin when you are out in the sun. Some people get all the vitamin D they need from sunlight. Others need to take vitamin D pills.

Exercise & a Healthy Lifestyle

Exercise helps your bones grow stronger. For detailed information, see page 15.

Smoking is bad for bones as well as the heart and lungs. Also, people who drink a lot of alcohol are more prone to bone loss and broken bones due to poor diet and risk of falling.

Symptoms

Osteoporosis is called the “silent disease” because bone is lost with no signs. You may not know that you have osteoporosis until a strain, bump, or fall causes a bone to break.

Diagnosis

A bone mineral density test is the best way to check your bone health. The most common method is called a DXA scan, but there are other methods, as well. This test can:

- Diagnose osteoporosis
- Check your risk of fracture
- See if treatments are making the bones stronger

Treatment

Treatment includes:

- A balanced diet rich in calcium and vitamin D
- An exercise plan
- A healthy lifestyle
- Medications, if needed



Photo: iStock

Osteoporosis can strike at any age, although the risk for developing the disease increases as you get older. In the future, more people will be at risk for having osteoporosis because people are living longer and the number of elderly is increasing.

Preventing Falls

Men and women with osteoporosis need to take care not to fall down. Falls can break bones. Some reasons people fall are:

- Poor vision
- Poor balance
- Certain diseases that affect how you walk
- Some types of medicine, such as sleeping pills

Some tips to help prevent falls outdoors are:

- Use a cane or walker
- Wear rubber-soled shoes so you don't slip
- Walk on grass when sidewalks are slippery
- In winter, put salt or kitty litter on icy sidewalks

To prevent falls indoors:

- Keep rooms, especially floors, free of clutter
- Use plastic or carpet runners on slippery floors
- Wear low-heeled shoes
- Do not walk in socks, stockings, or slippers
- Be sure carpets and area rugs have skid-proof backs or are tacked to the floor
- Be sure stairs are well lit and have handrails on both sides
- Put grab bars on bathroom walls near the tub, shower, and toilet
- Use a rubber bath mat in the shower or tub
- Keep a flashlight next to your bed

Free NIH Videos About Osteoporosis



The NIH Senior Health Web site features five brief, informative videos that discuss osteoporosis risk factors, coping strategies, exercise, and more. Go to the Web site below, and click on Osteoporosis.

<http://nihseniorhealth.gov/videolist.html>

Ask Your Health Professional

To discuss osteoporosis and bone health with your health professional, take along a list of questions (or use this one) to help you remember what you want to know.

- How can I know that I'm getting enough vitamin D and calcium?
- What is the condition of my bones now, relative to my age and gender?
- Am I at increased risk for fractures?
- What exercises should I do to help keep my bones strong?
- Do I need a bone density test?
- Should I be taking a prescription medication for osteoporosis?
- Will menopause affect my bone strength?
- What else can I do to prevent or treat osteoporosis?

Bone at the Breaking Point!



Bone is living tissue, and the inside of a healthy bone normally looks like a honeycomb. Every day, the body breaks down old bone and puts new bone in its place. As we get older, we break down more bone than we put back.



With osteoporosis, the spaces in the honeycomb become larger, reflecting the loss of bone. Bones that become weaker are more likely to break. People with osteoporosis most often break bones in the wrist, spine, and hip.

To Find Out More

MedlinePlus

- www.nlm.nih.gov/medlineplus/osteoporosis.html

NIH Senior Health

- <http://nihseniorhealth.gov/osteoporosis/toc.html>

NIH Osteoporosis and Related Bone Diseases National Resource Center

- www.bones.nih.gov

Build Up Your Bones!

Exercise is vital at every age for healthy bones, but it's very important for treating and preventing osteoporosis. Not only does exercise improve your bone health, it also increases muscle strength, coordination, and balance, and it leads to better overall health.

Why Exercise?

Like muscle, bone is living tissue that responds to exercise by becoming stronger. Young women and men who exercise regularly generally achieve greater peak bone mass (maximum bone density and strength) than those who do not. For most people, bone mass peaks during the third decade of life. (See chart below.) After that time, we can begin to lose bone. Women and men older than age 20 can help prevent bone loss with regular exercise. Exercising allows us to maintain muscle strength, coordination, and balance, which in turn helps to prevent falls and related fractures. This is especially important for older adults and people who have been diagnosed with osteoporosis.

The Best Bone-Building Exercise

The best exercise for your bones is the weight-bearing kind, which forces you to work against gravity. Some examples of weight-bearing exercises include weight training, walking, hiking, jogging, climbing stairs, tennis, and dancing. Examples of exercises that are not weight bearing include swimming and bicycling. Although these activities help build and maintain strong muscles and have excellent cardiovascular benefits, they are not the best way to exercise your bones.

Exercise Tips

If you have health problems—such as heart trouble, high blood pressure, diabetes, or obesity—or if you are age 40 or older, check with your doctor before you begin a regular exercise program. According to the U.S. Surgeon General, the optimal goal is at least 30 minutes of physical activity on most days, preferably daily.

If you have osteoporosis, ask your doctor which activities are safe for you. If you have low bone mass, experts recommend that you protect your spine by avoiding exercises or activities that flex, bend, or twist it. Furthermore, you should avoid high-impact exercise to lower the risk of breaking a bone. You also might want to consult with an exercise specialist to learn the proper progression of activity, how to stretch and strengthen muscles safely, and how to correct poor posture habits. Be sure to ask if he or she is familiar with the special needs of people with osteoporosis.

A Complete Osteoporosis Program

Remember, exercise is only one part of an osteoporosis prevention or treatment program. Like a diet rich in calcium and vitamin D, exercise helps strengthen bones at any age. But proper exercise and diet may not be enough to stop bone loss caused by medical conditions, menopause, or lifestyle choices such as tobacco use and excessive alcohol consumption. It is important to speak with your doctor about your bone health. Discuss whether you might be a candidate for a bone mineral density test. If you are diagnosed with low bone mass, ask what medications might help keep your bones strong.

Bone Mass Through the Lifespan: Exercise Helps Prevent Osteoporosis

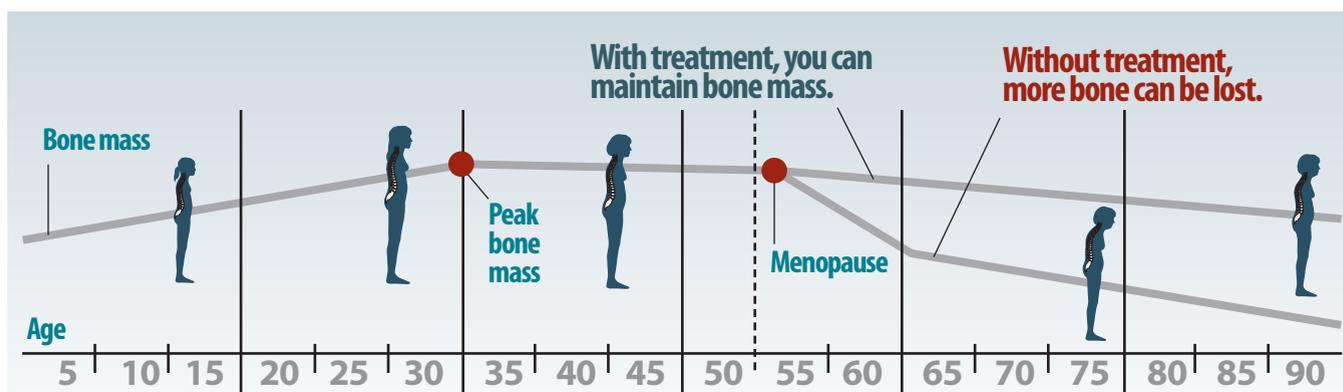


Illustration: Krames

“Be Sickle Smart!”



Photo: Ruben Studdard

Singing star and former *American Idol* winner Ruben Studdard wrote the song, “I Am a Fighter,” which has become the official anthem for the Be Sickle Smart campaign.

Singer Ruben Studdard fights for those with sickle cell disease

Recording artist and former *American Idol* winner Ruben Studdard has made the fight against sickle cell disease a part of his personal and professional life. He has been active in the national Be Sickle Smart community program.

How did you become interested in sickle cell disease?

My mother has long been an advocate for our local chapter of the Sickle Cell Disease Association of America (SCDAA) and was active in getting our community church involved in raising awareness of the disease. As a result, I have been aware of the hardships of patients—especially African American patients—suffering from sickle cell disease (SCD), including a serious and under-recognized condition called iron overload.

What has been your approach in raising public awareness of sickle cell disease?

I’ve made it my goal to do what I can to help people suffering from the disease by participating in the Be Sickle Smart program to inspire and empower them to take action for their health and be screened for iron overload due to blood transfusions. Be Sickle Smart is a community-health program that educates people with SCD about iron overload. I encourage everyone to join me in this effort to support families who are affected, and bring national attention to SCD as a public health issue.

For those who don’t know, many people with SCD receive regular blood transfusions to treat their disease, but may be unaware of the risk of iron overload due to these blood transfusions. It’s important to educate people about these risks, because 70,000 to 100,000 people, primarily African Americans, are affected by SCD. However, public awareness and resources for SCD are low.

What specific activities have you been involved with in your sickle cell work?

I’ve made several appearances across the U.S. on behalf of the program, and I have penned an original song, titled *I Am a Fighter*, which became the anthem for those participating in Be Sickle Smart. My intention with the song is to inspire people with SCD to keep fighting and to take action for their health through education. (www.besicklesmart.com)

Sickle Cell Research: Yesterday, Today, and Tomorrow

For an estimated 70,000 to 100,000 people in the United States, sickle cell disease is a painful, lifelong battle. But advances in sickle cell research are allowing many sickle cell patients to live productively. Sickle cell disease (also known as sickle cell anemia) is a serious disease in which the body makes sickle-shaped red blood cells. “Sickle-shaped” means that the cells look like crescents instead of the normal disc shape.

Under a microscope, normal red blood cells look like doughnuts without holes in the center. They move easily through blood vessels. Red blood cells contain the iron-rich protein hemoglobin. This gives blood its red color and carries oxygen from the lungs to the rest of the body.

Sickle cells contain abnormal hemoglobin that causes the cells to become sticky and crescent shaped, when the hemoglobin releases its oxygen. The stiff, sickle-shaped cells can stick to the lining of the blood vessels. This can damage the lining, creating “danger” signals that attract defensive cells. This response may enhance the “stickiness” and lead to more slowing of normal blood flow through the vessel. This reduces oxygen delivery to the tissues supplied by this partly blocked vessel.

People with sickle cell disease have a lower-than-normal number of red blood cells because sickle cells don’t live as long as normal cells after they leave the bone marrow. Sickle cells usually die after about 10 to 20 days, compared to normal red blood cells, which live an average of 120 days. The bone marrow can’t make new red blood cells fast enough to replace all the dying ones. This causes anemia, low blood count that results in fatigue, shortness of breath, and related symptoms. Because the cells are made normally, but die too rapidly, this is termed a “hemolytic” (destruction of red cells) anemia.

What Causes Sickle Cell Disease?

Sickle cell disease is inherited. Hemoglobin, the oxygen-carrying protein that is responsible for the red color of blood, is made of iron-containing heme and proteins called globins. People who have the disease inherit two copies of the globin gene that causes sickle cell disease. Those who live with the condition inherit a copy of the gene from each parent.

These genes, known as sickle globin genes, cause the body to make abnormal hemoglobin. In sickle cell disease, the abnormal hemoglobin chains may stick together after oxygen is delivered to the body’s tissues.

Those who inherit only one copy of the sickle globin gene (from one parent) and one copy of the normal globin gene, will not have sickle cell disease. Instead, they will have sickle cell trait. People who have sickle cell trait usually have few, if any, symptoms and lead normal lives. However, they can pass on the sickle globin gene to their children.

Who Is at Risk?

Sickle cell disease is most common in people whose families come from, or have ancestors from, sub-Saharan Africa, South or Central America (especially Panama), Caribbean islands, Mediterranean countries (such as Turkey, Greece, and Italy), India, and Saudi Arabia.

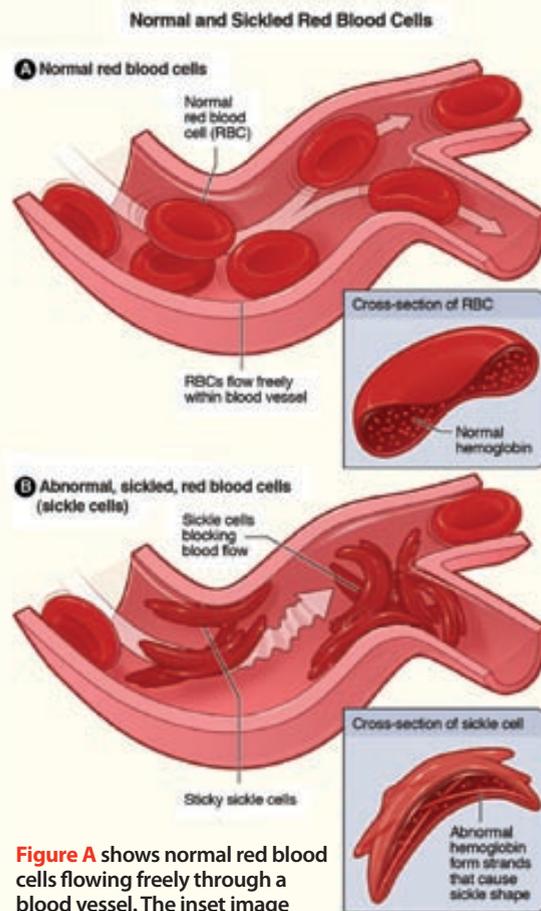


Figure A shows normal red blood cells flowing freely through a blood vessel. The inset image shows a cross-section of a normal red blood cell with normal hemoglobin.

Figure B shows abnormal, sickled red blood cells blocking blood flow in a blood vessel. (Other cells also may play a role in this process.) The inset image shows a cross-section of a sickle cell with abnormal hemoglobin.

Illustrations: National Heart, Lung, and Blood Institute

Ask Your Health Professional

If you, your child, or another loved one has been diagnosed with sickle cell disease, here are a few questions to ask.

1. **How can you tell that this is sickle cell disease?**
2. **Will my other children have the disease or sickle cell trait?**
3. **What other tests should be carried out?**
4. **What medications do you recommend, and why?**
5. **Will there be side effects?**
6. **Are there other treatments you can suggest that would also be helpful?**
7. **What is the long-term outlook for this disease?**
8. **Are there any restrictions on diet or exercise?**

Symptoms

Sickle cell disease is present at birth, but most infants don't show any signs until they are more than 4 months old.

Symptoms of sickle cell disease vary. In some people, they are mild, in others severe and requiring hospitalization.

The most common signs and symptoms are linked to anemia. Anemia is a condition in which blood has a lower than normal number of red blood cells. People with anemia do not have enough red blood cells, which deliver oxygen. As a result, they may feel tired or weak. Fatigue is one of the most common symptoms of sickle cell anemia.

Severe or long-lasting anemia can damage the heart, brain, lungs, kidney, spleen, and other organs of the body. Very severe anemia may even cause death.

Many people with sickle cell disease live with chronic pain, especially in their bones. However, sudden pain that can occur anywhere in the body is also a common symptom of sickle cell disease. This pain is called a "sickle cell crisis." Sickle cell crises often affect the bones, lungs, abdomen, and joints. Other symptoms of sickle cell disease include:

- Shortness of breath and/or dizziness
- Headache
- Coldness in the hands and feet
- Pale skin due to anemia
- Jaundice, or yellow eyes and skin
- Chest pain
- Leg ulcers that do not heal

Diagnosis

Early diagnosis of sickle cell disease is very important because many complications can be prevented with early diagnosis and treatment. Sickle cell disease and sickle cell trait can be diagnosed with a simple blood test.

In the United States, all state governments require testing for sickle cell disease as part of their newborn screening programs. The test uses blood from the blood samples used for other routine newborn screening tests. It can show whether a newborn infant has sickle cell disease or sickle cell trait. If the test shows sickle hemoglobin, a second blood test is done to confirm the diagnosis.

It's also possible for doctors to diagnose sickle cell disease before birth. This is done using a sample of amniotic fluid or tissue taken from the placenta. (Amniotic fluid is the fluid in the sac surrounding a growing embryo. The placenta is the organ that attaches the umbilical cord to the mother's womb.) This test can be done in the first few weeks of pregnancy.



Photo: iStock

100 Years of Sickle Cell Research

"This case is reported because of the unusual blood findings, no duplicate of which I have ever seen described."

—James B. Herrick, M.D.



In 1910, Dr. James B. Herrick, a physician at Presbyterian Hospital and professor of medicine at Rush Medical College in Chicago, Ill., published an article on the case of an anemic West Indian dental student, Walter Clement Noel. Herrick's laboratory findings of the patient's "peculiar elongated and sickle-shaped" red blood cells were

the first description of sickle cell disease in Western medical literature.

To mark the centennial of the publication of Herrick's report, the National Institutes of Health (NIH) held the James B. Herrick Symposium—Sickle Cell Disease Care and Research: Past, Present, and Future, in November on the NIH campus in Bethesda, Md. Eight NIH Institutes and Centers sponsored the symposium, which brought together sickle cell disease experts from around the globe.

“I Have Sickle Cell Disease, But Sickle Cell Doesn’t Have Me”



Photo: NHLBI
Tiffany McCoy is living a great life, despite sickle cell disease.

Tiffany McCoy has struggled with the effects of sickle cell disease. But today, thanks to advances in treatment, she lives a full and active life. Recently, she talked about sickle cell disease in a video created by the National Heart, Lung, and Blood Institute.

On living with sickle cell disease: I’ve lived with sickle cell my whole life. I’ve never known anything else. I have the most severe form of sickle cell disease.

The doctors told my parents that I probably wouldn’t live to see my 18th birthday. Sickle cell was like a death sentence. But now, it’s totally the opposite. I mean, people can live effective, prosperous, healthy lives. We’ve come a long way. Since I was a child, my parents have always told me, “You can be whatever you want to be. You can do whatever you want to do.” But after I had my daughter, I was really, really sick. I had a lot of hospital admissions—more than normal, more than I’ve ever had.

On managing a sickle cell “crisis”: A crisis is the hallmark of sickle cell disease—and a crisis is just pain—in any location of your body. You can have it wherever blood flows. If I had to describe it, it would be like repeatedly being stabbed with a butcher knife in the same spot, nonstop.

On relief through medication: Growing up, I took penicillin every day to prevent any kind of infection. My brother, who has had many more complications than I, tried hydroxyurea when he was about 13 or 14, and he had every side effect the medicine could offer. So, I was afraid.

But, I started taking hydroxyurea in May 2009, and it has really changed my life. I haven’t had a hospital admission in 13 months, and my blood numbers are wonderful. My doctor is totally pleased with it. I haven’t had any negative side effects from the medicine.

On staying healthy: It’s much more important for me to stay healthy now because of my baby girl. The day she was born, they

tested her for the disease, but I knew that she didn’t have it because her dad doesn’t have the trait or the disease. She does have the trait.

It’s also important because I love what I do, I love my job, I love life. And it’s not fun being sick. So, I do everything in my power to stay healthy. I take my medicines every day without fail. I don’t smoke and never will. I do eat fairly healthy.

On living a great life with sickle cell disease: Life right now is great. I’m healthy; I’m a mom to a beautiful little girl. I just bought a house, and I’m in school, getting my master’s in healthcare administration. It feels great to know that when my parents tell me I can do whatever I want to do and be whoever I want to be, that I’m actually doing that now.

Having a good attitude affects any area of your life. I always try my best to have a good outlook on life. I have sickle cell disease, but sickle cell doesn’t have me.

To Find Out More

- **MedlinePlus:**
www.medlineplus.gov
Enter “sickle cell disease” in the Search box
- **National Heart, Lung, and Blood Institute:**
http://www.nhlbi.nih.gov/health/dci/Diseases/Sca/SCA_WhatIs.html
- **Clinical Trials and Patient Recruitment:**
<http://patientrecruitment.nhlbi.nih.gov/sicklecell.aspx>
<http://clinicaltrials.gov>
Enter “sickle cell disease” in the Search box

Treatment

The goals of treating sickle cell disease are to prevent or relieve pain; prevent infections, organ damage, and strokes; treat anemia; and control complications.

Some doctors and clinics specialize in treating people who have sickle cell disease. Hematologists specialize in treating adults and children who have blood diseases and disorders.

Treating Pain

Mild pain is often treated with over-the-counter medicine and heating pads. Severe pain may need to be treated in a hospital. The usual treatments for acute (short-term) pain crises are fluids and pain-controlling medicines. Fluids help prevent dehydration, a condition in which the body doesn't have enough fluids. Fluids are given either by mouth or through a vein.

Common medicines used to treat pain crises include acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), and narcotics. Treatment for mild to moderate pain usually begins with NSAIDs or acetaminophen. If pain continues, a narcotic may be needed. Moderate to severe pain is often treated with narcotics. The narcotic may be used alone or with NSAIDs or acetaminophen.

Preventing Pain

Those with more severe sickle cell anemia may benefit from daily administration of a medicine called hydroxyurea. This medicine may help reduce the number of painful crises. Hydroxyurea is used to prevent painful crises, not to treat them when they occur.

Preventing Infection

Bacterial infections can be a major complication of sickle cell

disease, but often they can be prevented or treated. If a child who has sickle cell disease shows early signs of an infection, such as a fever, difficulty breathing, or localized bone pain, treatment should be given right away.

To prevent infections in babies and young children, treatments include:

- **Daily doses of penicillin.** Treatment may begin as early as 2 months of age and continue until the child is at least 5 years old.
- **All routine vaccinations** (including a yearly flu shot), plus vaccination(s) against streptococcus pneumonia.

Adults who have sickle cell disease should also receive flu shots every year and get vaccinated against pneumococcal infections. Both adults and children are at risk for a variety of infections, such as pneumonia and bone infections. They should be examined whenever they experience fevers, since early diagnosis and treatment result in better outcomes.

Preventing Complications

Complications from sickle cell disease can include gallstones, lung crises (acute chest syndrome), pulmonary hypertension, stroke, leg ulcers that don't heal, and eye damage.

Blood transfusions are commonly used to treat worsening anemia and sickle cell complications. Most patients with sickle cell disease have at least occasional blood transfusions. Patients with severe complications—such as stroke and acute chest syndrome—may require months or years of regular transfusions every three to four weeks to prevent ongoing damage.

Hydroxyurea treatment may be helpful in reducing crises and the need for transfusions.

People with sickle cell disease should have regular checkups to detect eye damage. And a simple ultrasound test of the head can identify children at high risk for strokes.

Recent Developments

Research on bone marrow transplants, gene therapy, and new medicines for sickle cell anemia is ongoing. The hope is that these studies will provide better treatments for sickle cell disease. Researchers also are looking for ways to predict the severity of the disease.

Bone Marrow Transplant

Bone marrow transplants can cure sickle cell disease. Because the procedure has significant risks, transplants are not appropriate for every patient.

Bone marrow transplants are used primarily in young patients who have severe sickle cell disease. However, the decision to give this treatment is made on a case-by-case basis.

Bone marrow used for a transplant must come from a closely matched donor. This is usually a close family member who doesn't have sickle cell disease.

Researchers continue to look for ways to reduce the risks of

this procedure and to widen its application.

Gene Therapy

Scientists are studying gene therapy as a possible treatment for sickle cell disease. Researchers want to know whether a normal gene can be put in the bone marrow of a person who has sickle cell disease. This would cause the body to make normal red blood cells.

Researchers also are studying whether they can "turn off" the sickle cell gene or "turn on" a gene that makes red blood cells behave more normally.

New Medicines

Researchers are studying several new medicines for sickle cell anemia. Some of these interfere with sickling of hemoglobin, others prevent the cells from sticking to blood vessel walls, and some raise levels of the hemoglobin present before birth—fetal hemoglobin.

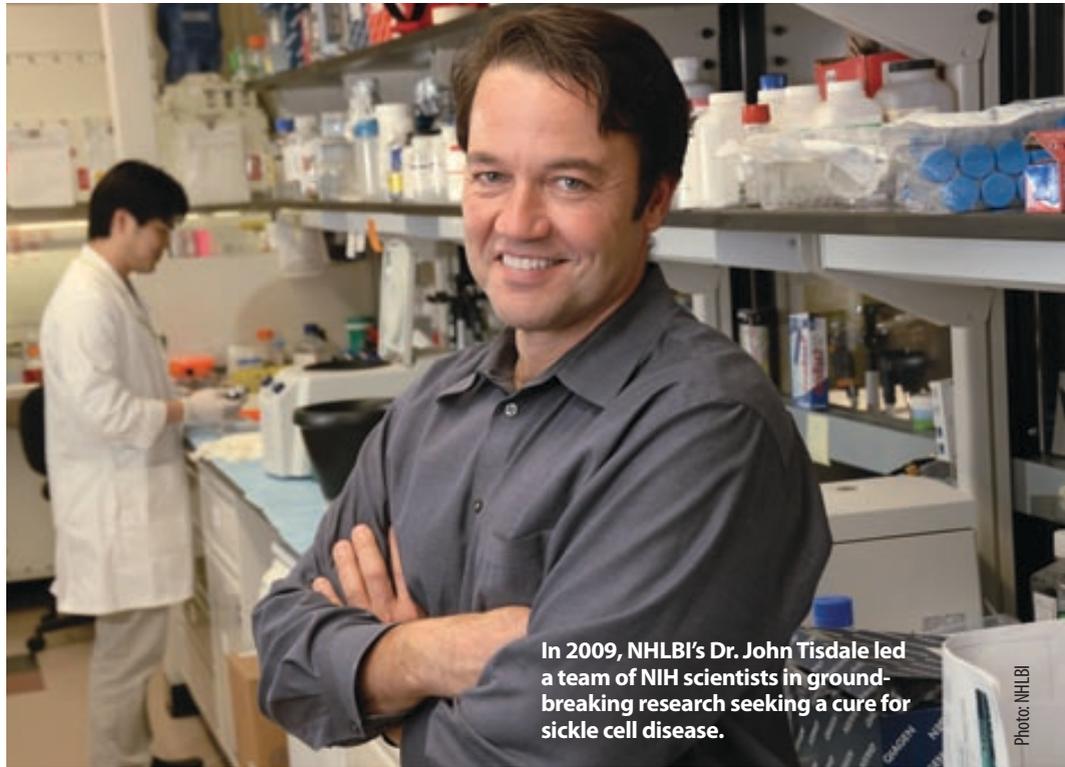
Latest Sickle Cell Research

While there is no widely available cure for sickle cell disease, there are treatments for its symptoms and complications. Over the past several decades, scientists and doctors have learned a great deal about sickle cell disease. They know its causes,

how it affects the body, and how to treat many of its complications. Thanks to improved treatment and care, people who have sickle cell disease are now living into their 40s or 50s or longer. The NHLBI continues to support efforts to find new and better treatments for sickle cell disease. Recent and current research efforts include:

- In 2009, scientists discovered that a modified transplant of adult blood stem cells could improve sickle cell disease in 9 of 10 adults who had been severely affected by the disease. The research, carried out at the NIH Clinical Center in Bethesda, Md., was a milestone in the search to cure sickle cell disease. Dr. John Tisdale led the team of researchers from the NHLBI, the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), and the National Institute of Allergy and Infectious Diseases (NIAID).
- In 2009, the NHLBI launched an initiative called Exploratory Studies in the Neurobiology of Pain in Sickle Cell Disease. Studies funded under the initiative allow experienced pain researchers to learn more about the biology of pain in sickle cell disease and to lay the groundwork for the development of effective drug treatments. One study is examining whether African American adults with sickle cell disease have different ways of experiencing pain compared to matched healthy adults. Other studies are evaluating pain perception in animal models of sickle cell disease.
- In 2010, a study found that neurologically normal adults with sickle cell disease scored lower on tests of brain function than neurologically normal adult participants who did not have sickle cell disease, suggesting that the disease may affect the

brain more than previously thought. This finding was part of the first study to examine brain function in adults with sickle cell disease and was funded by the NHLBI. A second study is ongoing to evaluate the impact of a new treatment on brain function.



In 2009, NHLBI's Dr. John Tisdale led a team of NIH scientists in groundbreaking research seeking a cure for sickle cell disease.

Photo: NHLBI

Other current and future research efforts include studies of:

- Genetic factors affecting sickle cell disease symptoms
- Regulation of hemoglobin production
- Development of drugs to increase fetal hemoglobin production
- Transplantation of blood-forming stem cells
- Gene therapy
- New treatments for pain
- Optimal uses of blood transfusion
- Management of iron overload associated with blood transfusions
- Development of animal models for preclinical studies
- Complications of sickle cell trait

Get Your Flu Shot!

It's flu season again—running from late fall 2010 through early spring 2011. The best way to avoid catching the flu is by getting a flu vaccination each year.

Here's what you need to know.

Influenza (the flu) is a contagious respiratory illness caused by influenza viruses. It spreads from person to person and can cause mild to severe illness; in some cases it can lead to death. Up to 20 percent of the American public gets the flu each year, and more than 200,000 people are hospitalized annually from flu-related complications, according to the Centers for Disease Control and Prevention (CDC). Deaths from flu-related causes average about 23,600 a year.

Although most healthy people recover from the flu without problems, certain groups of people are at high risk for serious complications. These include:

- people age 65 and older
- children younger than 2 years old
- people of any age who have chronic medical conditions, such as diabetes, asthma, congestive heart failure, or lung disease

Symptoms of the Flu

Symptoms for the seasonal flu and the 2009 H1N1 flu are similar. They include fever, cough, sore throat, body aches, headache, chills, and fatigue.

Facts About Vaccination

Flu vaccines have a very good safety record. Over the years, hundreds of millions of Americans have received seasonal flu vaccines.

For the 2010-2011 flu season, the flu vaccine provides protection against the 2009 H1N1 pandemic virus and two other flu viruses (an H3N2 virus and an influenza B virus) that research indicates will be most common during the upcoming season.

The viruses in the vaccine change each year based on



Photo: iStock

“For the 2010-2011 flu season, the flu vaccine provides protection against the 2009 H1N1 pandemic virus, as well as two seasonal flu viruses.”

international surveillance and scientists' estimates about which types and strains of viruses will circulate in a given year.

About two weeks after vaccination, antibodies that provide protection against influenza virus infection develop in the body.

Who Should Get Vaccinated for Flu?

- Everyone six months of age and older should get vaccinated against the flu as soon as possible.
- People at high risk of serious complications from the flu include children, pregnant women, people with chronic health conditions like asthma, diabetes or heart and lung disease and people 65 years and older.

When healthy people get vaccinated, they slow the spread of flu and protect people who are at high risk of serious complications from the flu.

The Two Types of Flu Vaccine

There are two types of vaccines:

- **The flu shot** — an inactivated vaccine (containing killed virus) that is given with a needle, usually in the arm. The flu shot is approved for use

in people older than six months, including healthy people and people with chronic medical conditions.

- **The nasal-spray flu vaccine** — a vaccine made with live, weakened flu viruses that do not cause the flu (sometimes called LAIV for “live attenuated influenza vaccine” or FluMist). LAIV is approved for use in healthy people 2-49 years of age who are not pregnant.

Find Flu Clinics Near You At www.flu.gov

Use the Flu Vaccine Finder at www.flu.gov to find nearby locations offering flu shots or nasal spray flu vaccine. Locations are being added and updated throughout the season by the Department of Health and Human Services (HHS).



Help Stop the Flu

The CDC recommends that Americans do the following to help stop the flu:

- Cover nose and mouth with a tissue when you cough or sneeze. Dispose of the tissue after use.
- Wash hands often with soap and water or alcohol-based hand cleaners after coughing or sneezing.
- Avoid touching your eyes, nose, or mouth.
- Avoid close contact with sick people.
- Stay home from work or school if you are sick.
- Get vaccinated (for everyone six months or older).



Photo: iStock

Latest NIH Flu Research

Scientists at the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health (NIH), and researchers supported by NIAID worldwide are working together to find better ways to prevent, diagnose, and treat seasonal and pandemic influenza, including 2009 H1N1 flu.

Developing new and improved flu vaccines is a high priority of NIAID through its influenza vaccine research program. NIAID works nationally with academic medical centers and organizations that provide a ready resource for conducting clinical trials to study promising vaccines and treatments for flu and other infectious diseases. Progress is being made in new technologies that produce vaccines, including vaccines against the flu.

To Find Out More

MedlinePlus:

- www.nlm.nih.gov/medlineplus/flu.html

National Institute of Allergy and Infectious Diseases:

- www.niaid.nih.gov/topics/Flu

U.S. Department of Health and Human Services:

- <http://flu.gov>

Centers for Disease Control and Prevention:

- www.cdc.gov/flu/

ClinicalTrials.gov:

- www.clinicaltrials.gov; type "influenza" into the Search box to find the latest flu studies

Latinos and Vision Loss

Latinos in the United States have higher rates of vision loss and blindness than any other racial or ethnic group in the country. That's according to a study that is the first to track vision loss and eye disease in the Latino community. The Los Angeles Latino Eye Study (LALES) also found Latinos are more likely to develop diabetic eye disease and cataracts than non-Hispanic whites. The lead investigator says the results show the need for Latinos, especially those with diabetes, to have regular dilated eye exams. The National Eye Institute supported the study.



Depression High For Victims of Cyberbullying

Young people who are targeted by cyberbullies are more likely to experience depression than the kids doing the bullying. Cyberbullies harass their victims with written messages sent over the computer or cell phone. Because there's no face-to-face contact, researchers say victims can't see or identify their attacker and that may cause feelings of isolation or helplessness. Previous studies looked at traditional forms of bullying that include physical violence or verbal taunts. In those studies, depression was highest among so called bully-victims, young people who were bullies and were also the victim of bullies. The studies were conducted by the Eunice Kennedy Shriver National Institute of Child Health and Human Development.

More Helpful Information for Older Americans

Three new health topics have been added to NIHSeniorHealth.gov (www.nih seniorhealth.gov), a health and wellness Web site for older adults developed by the National Institute on Aging and the National Library of Medicine. In *Creating a Family Health History*, older adults can learn how to collect, organize, and use information about their family's health history to promote healthy behaviors among current and future generations. *Alcohol Use and Older Adults* describes alcohol's effects on our bodies, health, and lifestyles as we age and explores the risks and benefits of late life drinking. *Peripheral Arterial Disease (P.A.D.)* offers information about the risk factors, diagnosis, and treatments for this disease, which develops when arteries in the body become clogged with fatty deposits, limiting blood flow. It affects an estimated 8 to 12 million people, most of them over age 50.

Children, Males, and Blacks at Increased Risk for Food Allergies

A new study estimates that about 7.6 million Americans, or 2.5 percent of the U.S. population, have food allergies. Children, males, and blacks had the highest rates. Researchers say more study is needed to understand why. The study also found an association between food allergies and severe asthma. The odds of people with asthma and food allergies experiencing a severe asthma attack were 6.9 times higher than people without food allergies. The National Institute of Environmental Health Sciences conducted and supported the research.

Starting HIV Treatment Early Has Benefits

Scientists have identified another health benefit to starting HIV treatment soon after infection. A new study finds that people who begin antiretroviral therapy (ART) within six months of acquiring HIV may be better able to fight other disease-causing microbes than people who begin treatment later. Researchers say the findings suggest that early ART may prevent irreversible damage to the immune system. This work adds to a growing body of evidence supporting early treatment. Scientists with the National Institute of Allergy and Infectious Diseases conducted the study.

Stroke Prevention: Surgery vs. Stent?

A major study of two procedures to prevent stroke finds that both are safe and effective. A surgical procedure known as a carotid endarterectomy is considered the gold standard. It was compared with a newer and less invasive procedure known as carotid artery stenting. While both procedures were found to be equally safe and effective, there was a slight difference based on age. Stenting results were a little better for people 69 and younger; and surgery results were slightly better for people



Photo: iStock

70 and older. Researchers say the findings could help physicians tailor the treatment to the patient. The National Institute of Neurological Disorders and Stroke funded the study.

Newsletters & Feeds: nih.gov/Subscriptions.htm

To stay up to date with information from the NIH Institutes and Centers—including the National Library of Medicine—subscribe to any of the free electronic communications available.

They are listed, with links, at nih.gov/Subscriptions.htm.

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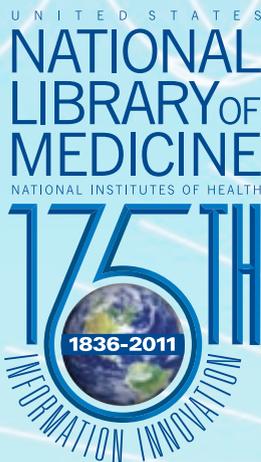
The World Leader in Health Information and Innovation

Celebrates 175 Years



Photo: jessikamarotte.com

National Library of Medicine staff members celebrate NLM's 175th anniversary, standing in front of the current Library building on the NIH campus in Bethesda, Md.



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

In 1836, the library of the U.S. Army Surgeon General consisted of a small collection of medical books on one shelf. Today, the National Library of Medicine (NLM) is the world's largest biomedical library. With some 14 million items in more than 150 languages, it is the worldwide leader in trusted medical and health information and innovation.

But this unique library is about much more than books. Every day it delivers trillions of bytes of data crucial to the lives of millions everywhere. NLM-designed databases and tools

lead people to helpful medical literature and health information; help researchers study genes and their role in disease; provide emergency responders with critical information on hazardous substances, and much, much more.

The Library is a leader in biomedical informatics, which is the use of computers and communications technology in biology, medicine, and health. NLM conducts and funds informatics research and trains future generations of scientists and information specialists. It plays an essential role in the



All Photos: National Library of Medicine

The first three buildings that housed the National Library of Medicine, beginning in 1836: (clockwise from top) the U.S. Army Surgeon General's Office, Ford's Theatre, and the Army Medical Library

development of electronic health records, health data standards, and the exchange of health information.

In this and coming issues, we will highlight some of NLM's most important contributions to its mission to acquire, organize, and disseminate biomedical information for the betterment of American—and global—human health.

Creating Information Resources for Researchers

Since the dawn of the computer age, some 50 years ago, NLM has been at the forefront, delivering specific, trusted information in timely, innovative ways. In 1971, for example, NLM created Medline, an online database of references to the biomedical literature. Completely free access to Medline began in 1997 through PubMed, a new access system.

Today, PubMed/Medline (<http://www.ncbi.nlm.nih.gov/pubmed/>) contains over 20 million references to articles published in more than 5,300 current biomedical journals from the U.S. and over 80 foreign countries. It is approaching one billion searches a year from users worldwide.

Much of the research and development at NLM is done at its Lister Hill National Center for Biomedical Communications (LHNCBC) and the National Center for Biotechnology Information (NCBI). NCBI is meeting the challenge of organizing, analyzing, and disseminating scientific research data with a suite of more than 40 integrated databases and software technologies that are enabling the genetic discoveries of the 21st century.

Lister Hill researchers use computer and communications technologies to improve the way information is organized, stored, retrieved, and preserved. One of its most well-used databases is ClinicalTrials.gov (www.clinicaltrials.gov), launched in 2000. ClinicalTrials.gov is the world's largest clinical trials database,

including registration data for nearly 100,000 clinical studies with sites in 174 countries. It recently has been expanded to include summary results and information about any adverse events.

Dozens of other NLM Web-based information resources also are available. For a list of all NLM resources, go to www.nlm.nih.gov/databases.

Serving the Public with Up-to-Date Information

Through consumer-friendly sites, such as MedlinePlus (www.medlineplus.gov) and NIH Senior Health (www.nihseniorhealth.gov), NLM provides timely, accurate, and understandable information to help patients, their families, and the public play a more active role in managing their health and health care.

MedlinePlus has over 700,000 Web visits every day from visitors in all but a handful of the world's 194 countries. In addition to covering more than 800 health topics, MedlinePlus offers interactive tutorials, medical dictionaries, a medical encyclopedia, directories of hospitals and providers, and the latest health news.

To reach the rapidly exploding mobile Internet audience around the world, NLM recently launched Mobile MedlinePlus (<http://m.medlineplus.gov>), in English and Spanish, which delivers the same high quality, trusted consumer health information to cell phones and other mobile devices.

Developing Electronic Health Records for 21st Century Medicine

For more than three decades, NLM has supported pioneering research on electronic health records, clinical decision-making support, and health information exchange. The Library produces, supports, and disseminates the key clinical terminology standards used in electronic health data. NLM has also recently released the

Within a week of the Haiti earthquake tragedy, NLM launched a Health Resources for Haiti Web page, with information in English and Haitian Creole. Working with libraries and American publishers, NLM made available free, full-text articles from hundreds of biomedical journals and reference books for medical teams responding to the disaster.



All Photos: National Library of Medicine

Library Hall on a quiet afternoon in the late 1880s, shortly after the Library was relocated from Ford's Theatre to the National Mall.

MedlinePlus Connect feature, to enable patients, hospital discharge nurses, or physicians to link directly from problems and medications in a patient's record to explanations of these same terms in MedlinePlus.

Assisting in Emergencies

When disasters strike, the Library moves swiftly to meet people's needs through its Disaster Information Management Research Center (DIMRC), which facilitates access to disaster information, promotes effective use of libraries and disaster information specialists for disaster management, and supports initiatives to ensure uninterrupted access to critical health information resources when disasters occur.

Going Beyond Bricks and Mortar

The NLM has many programs that fall outside the traditional role of a library as a repository of published works. For instance, in a 1990s project called The Visible Human, Lister Hill scientists built a library of digital images of the complete anatomy of a normal male and female. Almost 3,200 individuals and institutions in 61 countries have licensed the data for a wide range of educational, diagnostic, treatment planning, virtual reality, and industrial uses.

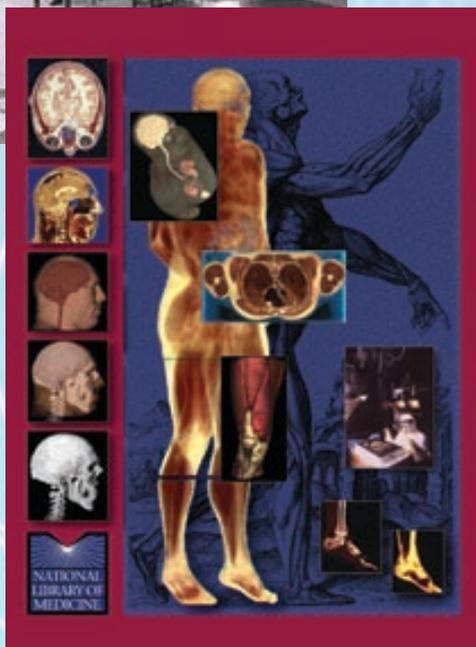
The Library maintains PubMedCentral, which provides free, unrestricted access to a Web-based bank of more than two million full-text articles from newly published material based on NIH-supported research projects, as well as from digitized older material previously available only in printed form.

NLM's historical resources form the basis for a continuing program of exhibitions that may be visited in person or online. Smaller, traveling exhibitions—on topics as diverse as Charles Darwin, Harry Potter, Frankenstein, and America's women physicians—tour throughout the United States thanks to partnerships with the American Library Association, the National Endowment for the Humanities, and others.

Poised for the Future

NLM's information services and research programs serve the nation and the world by supporting scientific discovery, clinical research, education, health care delivery, public health response, and the empowerment of people to improve personal health.

The Library is committed to the innovative use of computing and communications to enhance effective public access to understanding and discovery in human health.



A poster of NLM's Visible Human Project, which created complete, anatomically detailed, three-dimensional representations of the normal male and female human bodies.

Info to Know

NIH Quickfinder

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

Institutes

- **National Library of Medicine (NLM)**
www.nlm.nih.gov
1-888-FIND-NLM (1-888-346-3656)
- **National Cancer Institute (NCI)** www.cancer.gov
1-800-4-CANCER (1-800-422-6237)
- **National Eye Institute (NEI)** www.nei.nih.gov
(301) 496-5248
- **National Heart, Lung, and Blood Institute (NHLBI)**
www.nhlbi.nih.gov (301) 592-8573
- **National Human Genome Research Institute (NHGRI)** www.genome.gov (301) 402-0911
- **National Institute on Aging (NIA)** www.nia.nih.gov
Aging information 1-800-222-2225
Alzheimer's information 1-800-438-4380
- **National Institute on Alcohol Abuse and Alcoholism (NIAAA)** www.niaaa.nih.gov
(301) 443-3860
- **National Institute of Allergy and Infectious Diseases (NIAID)** www.niaid.nih.gov
(301) 496-5717
- **National Institute of Arthritis and Musculoskeletal and Skin Diseases** www.niams.nih.gov
1-877-22NIAMS (1-877-226-4267)
- **National Institute of Biomedical Imaging and Bioengineering (NIBIB)** www.nibib.nih.gov
(301) 451-6772
- **Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)**
www.nichd.nih.gov 1-800-370-2943
- **National Institute on Deafness and Other Communication Disorders (NIDCD)**
www.nidcd.nih.gov 1-800-241-1044 (voice)
1-800-241-1055 (TTY)
- **National Institute of Dental and Craniofacial Research (NIDCR)** www.nidcr.nih.gov
(301) 480-4098
- **National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)** www.niddk.nih.gov
Diabetes 1-800-860-8747
Digestive disorders 1-800-891-5389
Overweight and obesity 1-877-946-4627
Kidney and urologic diseases 1-800-891-5390
- **National Institute on Drug Abuse (NIDA)**
www.nida.nih.gov (301) 443-1124
- **National Institute of Environmental Health Sciences (NIEHS)** www.niehs.nih.gov
(919) 541-3345
- **National Institute of General Medical Sciences (NIGMS)** www.nigms.nih.gov
(301) 496-7301
- **National Institute of Mental Health (NIMH)**
www.nimh.nih.gov 1-866-615-6464
- **National Institute of Neurological Disorders and Stroke (NINDS)** www.ninds.nih.gov
1-800-352-9424
- **National Institute of Nursing Research (NINR)**
www.ninr.nih.gov (301) 496-0207

Centers & Offices

- **Fogarty International Center (FIC)**
www.fic.nih.gov (301) 402-8614
 - **National Center for Complementary and Alternative Medicine (NCCAM)**
www.nccam.nih.gov 1-888-644-6226
 - **National Center on Minority Health and Health Disparities (NCMHD)** www.ncmhd.nih.gov
(301) 402-1366
 - **National Center for Research Resources (NCRR)**
www.ncrr.nih.gov (301) 435-0888
 - **NIH Clinical Center (CC)**
www.cc.nih.gov (301) 496-2563
 - **Office of AIDS Research (OAR)**
http://www.oar.nih.gov (301) 496-0357
 - **Office of Behavioral and Social Sciences Research (OBSSR)**
http://obssr.od.nih.gov (301) 402-1146
 - **Office of Rare Diseases Research (ORDR)**
http://rarediseases.info.nih.gov
Genetic and Rare Disease Information Center
(888) 205-2311 Toll-free
 - **Office of Research on Women's Health (ORWH)**
http://orwh.od.nih.gov (301) 402-1770
- Marin P. Allen, Ph.D.**, Office of Communications and Public Liaison, NIH
- Joyce Backus**, National Library of Medicine (ex-officio)
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- Diane Striar**, National Heart, Lung, and Blood Institute
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- Larry Thompson**, National Human Genome Research Institute
- Anne Thurn, Ph.D.**, Office of Dietary Supplements

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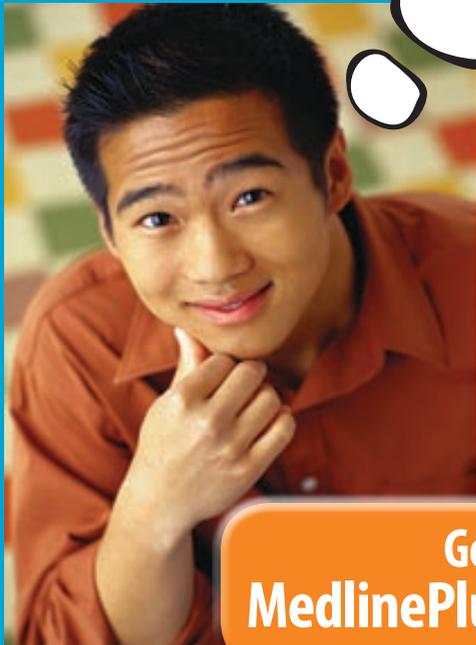
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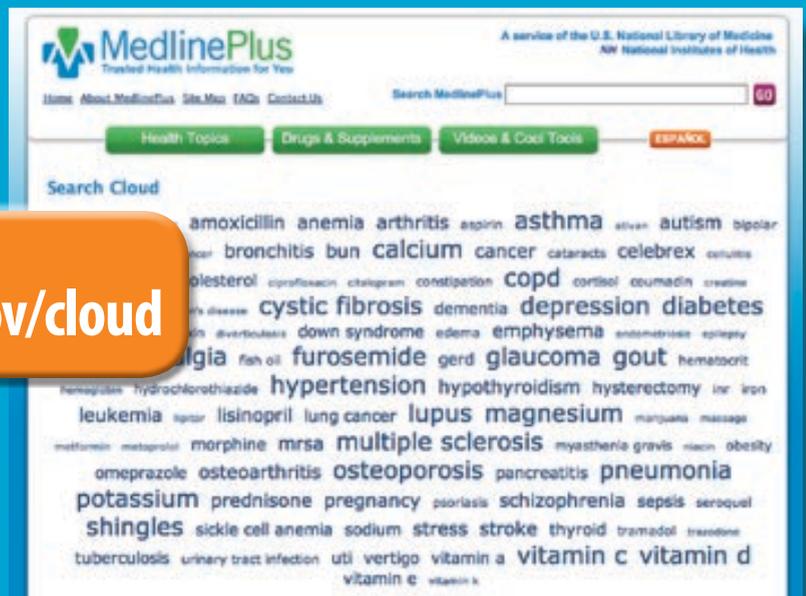
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fibromyalgia gout hypertension
lupus pneumonia **shingles**

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www.nlm.nih.gov/medlineplus/spanish/cloud.html



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