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FDA student intern Kenneth Pierce transfers bacteria from blood agar plates for freezing and storage. Later, he will test their resistance to more than 30 different antibiotic drugs. See page 32 for more information on the FDA's research projects and the agency's role in training future scientists.
Imagine the development of a pill that cuts the incidence of Type 2 diabetes by more than half among those people most at risk of developing the disease. Headlines, profit predictions, and praise from patient advocates would likely follow.

The news in August that eating less fat, exercising two and a half hours a week and losing a moderate amount of weight can accomplish the same thing as that imaginary pill generated the same kind of excitement—minus the profit prognostications.

Sixteen million Americans have Type 2, or adult onset, diabetes. It is most common in people older than 40 and is the main cause of kidney failure, limb amputations, and new onset blindness in adults.

At least 10 percent of the U.S. population is at high risk of developing the disease. Those most at risk include African Americans, Hispanic Americans, Asian Americans and Pacific Islanders, and American Indians. Others at high risk include those older than 60, women with a history of gestational diabetes, and people with a close relative who has the disease. For more on the study and its implications, see the story on page 10.

Our cover story this month, “Vision Correction: Taking a Look at What’s New,” focuses on the latest in vision correction. You’ve probably heard the hype on a variety of laser vision correction techniques. We bring you some of the pitfalls and concerns to consider, along with developments in contact lenses and eyeglasses.

Most people take medicines responsibly, but millions of Americans each year misuse prescription drugs to get high, calm down, or for other unauthorized purposes. In our feature on prescription drug abuse, you’ll find out about the problem from a woman who lived it.

From the eggs you eat for breakfast to the juice you serve your kids, food safety remains a top priority at the FDA. Joseph A. Levitt, director of the FDA’s Center for Food Safety and Applied Nutrition, describes the challenges of keeping the U.S. food supply safe in an FDA Consumer interview.

In addition to its role as a regulatory agency, the FDA provides a fertile training ground for many future physicians and scientists through its Office of Research. We invite you to take a look at the innovative experiments being done by this year’s student interns.

Raymond Formanek Jr.
Interim Editor

Diabetes Drugs

There is an inaccuracy in the article, “New Drug and Device Approved to Manage Diabetes” (Updates, March–April 2001 FDA Consumer). Specifically, the statement “Prandin at recommended doses generally will have less effect on glucose control than sulfonylureas” is incorrect. The regulatory basis of approval for Prandin included demonstration of comparability of efficacy and safety for Prandin and sulfonylureas glyburide and glipizide.

Mary Ann McElligott, Ph.D.
Senior director, regulatory affairs
Novo Nordisk
Princeton, N.J.

Robert I. Misbin, M.D., a medical officer in the FDA’s division of metabolic and endocrine drug products, responds:

“Dr. McElligott is correct. When used as initial therapy in previously untreated patients with Type 2 diabetes, Prandin caused reductions in glucose and glycosylated hemoglobin levels that are similar to what would be expected from sulfonylureas. Glycosylated hemoglobin, also known as hemoglobin Alc (HbAlc), is an index of long-term blood glucose concentration. Lower levels of glucose and HbAlc are associated with a reduced risk of developing long-term complications from diabetes.”

Eggs: Sunny Side Up

We’ve heard that the FDA will not allow restaurants to cook eggs sunny side up after Sept. 1. Is this true? Why is the FDA doing this?

Pam and Steve McFarlan
Burnsville, Minn.

Joseph A. Levitt, director of the FDA’s Center for Food Safety and Applied Nutrition, replies:

“There has been some confusion recently in the media over the egg regulation. Some reports have said that the FDA was prohibiting restaurants from serving eggs “sunny side up.” That’s simply not true. There clearly is the element of consumer choice involved here. There is no FDA requirement that prevents a restaurant from serving eggs in any way a consumer asks for them.

What we want to do is to provide the information as to what steps consumers can take to protect themselves. Those who are most likely to be affected by foodborne illnesses are the very young, older people, those with compromised immune systems, and pregnant women. We think that consumers need to know what they can do to minimize any risk.

Our new egg handling instructions that will appear on consumer egg cartons beginning this fall say it’s important to cook eggs thoroughly and to keep them refrigerated.”

We’re eager to hear what you like and what you don’t like. We also want to know the subjects you’d like to see covered. Letters to the editor can be e-mailed to FDAC-letters@oc.fda.gov, or mailed to FDA Consumer, Food and Drug Administration (HFI-40), 5600 Fishers Lane, Rockville, MD 20857. Letters should be 300 words or less, signed, and include an address and telephone number for verification. The editor reserves the right to edit letters for space and appropriateness.
**To the Editor (continued)**

Editor’s note: For more on the FDA’s food safety priorities, see “Food for Thought...” on page 12.

**Hepatitis C Testing**

I am concerned and confused after reading “Hepatitis C: An Update” in your magazine, July-August 2001 issue. Under the topic heading “Disease in Decline,” I find it very interesting that out of 8,000 U.S. military records that were reviewed, 17 recruits tested HCV positive 45 years earlier. What does this statement mean exactly? HCV testing has only been available for slightly over the past 10 years, so how could 17 recruits have tested positive when there was no way of testing them for HCV?

Martha Warner
Los Angeles

Leonard Seeff, M.D., a hepatologist at the National Institute of Diabetes and Digestive and Kidney Diseases and lead investigator on the 45-year follow-up study of HCV infection in military recruits, responds:

“Because of an outbreak of streptococcal infection and rheumatic fever on a military base between 1948 and 1956, blood was drawn from 8,568 recruits to test for the presence of streptococcal antibodies. Thereafter, the specimens were placed in a freezer, where they remained for over 45 years. The stored samples were tested for the presence of HCV several years after the assay for this virus became available.”

**Food Allergens**

An article in the July-August 2001 issue of FDA Consumer suggests better labeling for ingredients in food products (“Food Allergies: When Food Becomes the Enemy”). However, two very important items were omitted from the eight foods listed. Corn and sulfites can both cause severe reactions to individuals who are sensitive to them.

I, personally, have extreme reactions to sulfites in all their various forms and now need to carry a syringe of adrenaline (epinephrine) with me at all times to treat reactions. There are still many times when I have found sulfites listed in foods in which one would never have anticipated their presence. It is only through a sense of what one could almost call paranoia that I check labels. However, there have been numerous times when I have sensed a reaction building and yet did not see sulfites listed as an ingredient. For that matter, just this past week, I used a condiment that had previously not listed sulfiting agents and now does. It’s rather frightening to know that what I thought was a “safe” food can change overnight to one that my ingesting could necessitate emergency medical care.

I urge you to ensure that corn and sulfites are included in this new labeling initiative.

Rita B. Mako
Baltimore

**Updates**

**Ribavirin and Chronic Hepatitis C Infection**

People with hepatitis C now have more flexible treatment options. In July, the FDA approved a stand-alone package of Rebetol (ribavirin) Capsules, an anti-viral drug for use with Intron A (interferon alfa-2b) for the treatment of chronic hepatitis C infection.

In 1998, the FDA approved Rebetol in a combination package with Intron A. This package, Rebetron Combination Therapy, was approved for treatment of people with chronic hepatitis C infection who have not had previous interferon therapy or who have relapsed following successful interferon therapy. Both ribavirin products are marketed by Schering Corp., Kenilworth, N.J.

This separate packaging of Rebetol Capsules gives health-care providers flexibility in adopting individualized ribavirin and interferon-based therapies for people with hepatitis C. These therapies do not cure the infection, but work together to suppress the level of hepatitis C virus in the blood. Rebetol Capsules are not effective when used alone.

People who buy Rebetol Capsules will receive a medication guide that explains side effects associated with Rebetol Capsules and Rebetron Combination Therapy.

The most important side effect of Rebetol Capsules is anemia. People taking the drug should have their red blood cell counts checked regularly. Fatal and non-fatal heart attacks have occurred in people with anemia caused by Rebetol Capsules. People with a history of significant or unstable heart disease should not be treated with Rebetol Capsules.

Rebetol Capsules may cause birth defects and may lead to death of a fetus. To avoid birth defects, extreme care must be taken to prevent pregnancy in women being treated with Rebetol Capsules and in women whose male sexual partner is being treated.

Other common adverse events associated with Rebetol Capsules include fatigue, nausea, rash and itching.

Hepatitis C infection is a chronic condition caused by a virus, spread mainly by contact with an infected person’s blood, that damages the liver. (See “Hepatitis C: An Update” in the July-August 2001 FDA Consumer.)
Adjustable Stomach Band Approved for Severe Obesity

An adjustable elastic silicone band that in essence "shrinks" the stomach has been approved to help severely obese people lose weight.

The Lap-Band Adjustable Gastric Banding System is a device that is placed by laparoscopic "keyhole" surgery around the upper part of the stomach to create a small gastric pouch. This limits food consumption and creates an earlier feeling of fullness. The band is inflatable and connected to an access port placed close to the skin that allows surgeons to either tighten or loosen the band to meet an individual's needs. Once the band is in place, it is inflated with a salt water solution (saline). The procedure is reversible and does not require cutting or stapling of the stomach.

In June, the FDA approved the device for people who are more than 100 pounds overweight or who weigh at least twice their ideal body weight, and who have failed to lose weight by other means. People who use the Lap-Band will need to diet and exercise to help maintain their weight loss.

Severely obese people often develop serious health problems such as hypertension, gall bladder disease, and diabetes as a result of their excess weight. For them, being overweight is a serious health issue, not just a cosmetic problem.

The only surgical treatments for severely overweight people prior to approval of the Lap-Band were more invasive procedures such as stomach stapling and gastric bypass.

The manufacturer, BioEnterics Corporation of Carpinteria, Calif., did a three-year study of 178 people treated with the Lap-Band at eight U.S. medical centers. Most participants steadily lost weight and after 36 months had lost an average of 36 percent of their excess weight. Two percent gained some weight, and 5 percent neither lost nor gained.

The most common side effects reported included nausea and vomiting, heartburn, abdominal pain, and band slippage or pouch enlargement.

Reducing the Risk of Meningitis Among Incoming Freshmen

College freshmen living in dormitories have a higher risk of contracting meningitis than other college students, a recent study indicates.

Researchers, led by Michael Bruce, M.D., of the Centers for Disease Control and Prevention, say that vaccinating incoming freshman each year could substantially decrease their risk of contracting meningococcal meningitis—a bacterial infection of the membranes around the brain and spinal cord. The infection can be spread by kissing or sharing utensils.

Meningococcal meningitis is fatal in about 10 percent of cases and causes significant harm in another 10 percent. Another form, viral meningitis, generally is less serious. Earlier studies have shown that students who live on campus have a higher risk of developing the disease than students who live in off-campus housing.

The latest study, published in the Aug. 8 issue of the Journal of the American Medical Association, analyzed the records of 96 American college students ages 18 to 23 who were found to have had meningococcal infection between Sept. 1, 1998, and Aug. 31, 1999. According to Bruce, 68 percent of the 79 students for whom information was available had infections that may have been prevented through vaccination. The study also found that the overall incidence of meningococcal meningitis was

Health and Human Services Secretary Tommy Thompson (foreground) listens to a briefing by Joseph Levitt, director of the FDA's Center for Food Safety and Applied Nutrition. Mr. Levitt encouraged Secretary Thompson to enlist the support of Congress, the food industry, consumer group leaders, and educational groups to help increase food safety awareness. For more on food safety see page 12.
New Heart Device Cleared

The FDA has cleared for marketing a new device designed to prevent blood clots in people who undergo heart surgery. The PercuSurge Guardwire Plus device is intended for use on people who have previously had coronary bypass surgery and whose bypass vein graft has become blocked.

Coronary bypass surgery creates new routes for blood flow to the heart muscle when coronary arteries become blocked. This involves taking a healthy blood vessel from another part of the body and grafting it onto the heart. About 500,000 people have coronary bypass vein grafts each year. It is estimated that after a decade, at least half will have blockages in those vein grafts.

These blockages require treatment such as insertion of a stent during angioplasty, which opens up a narrowed vessel. The PercuSurge device is used during these procedures to collect and remove debris that results from treatment. The debris—small blood clots, cholesterol crystals, and other particles—may cause serious problems, such as heart attack, if it is swept down the vein graft into the heart. Major problems from loose debris occur in 10 percent to 20 percent of patients. The new device was shown in clinical trials to significantly minimize this risk.

Clinical investigators compared the results of 406 people who underwent angioplasty or stenting to unblock coronary bypass veins with the device and compared them to 395 people who received treatment without the device. The incidence of major problems caused by loose debris was 17 percent in the standard care group compared with 10 percent in the group treated with the new device.

PercuSurge, Inc., a division of Medtronic AVE, Sunnyvale, Calif., makes the PercuSurge Guardwire Plus.

FDA Clears Camera Pill to Photograph Small Intestine

A capsule containing a tiny camera that, when swallowed, takes pictures of the inside of the small intestine has been approved by the FDA.

The Given Diagnostic Imaging System is a technological advance for detecting polyps, cancer, or causes of bleeding and anemia in the gastrointestinal tract. Snapping pictures twice a second, the camera-capsule also contains lights, a transmitter, and batteries and has a clear end that allows the camera to view the lining of the small intestine.

Prior to the approval of the tiny camera, the standard method of detecting abnormalities in the intestines was through endoscopic exam, in which doctors inserted a scope down into the small intestine through the mouth. But these scopes are unable to reach through the entire 20-foot-long small intestine, and provide a partial view. Available only by prescription, the camera capsule enables doctors to see areas that the endoscope cannot reach.

To do an examination using the device, a person swallows the camera-capsule and the muscles of the digestive tract propel it forward first through the stomach, then into the small intestine, into the large intestine, and then out in the stool. The device transmits images to a data recorder, which is worn on a belt around the person’s waist. The physician then transfers the stored data to a computer for processing and analysis.

The battery has an eight-hour life expectancy, which generally is long enough to photograph the small intestine, but not the entire gastrointestinal tract.

The FDA clearance of the device was based on its safety, lack of side effects, and its ability to detect abnormalities in the small intestine, including parts that can’t be reached by the endoscope. The device must be used along with other endoscopic and radiological evaluations of the small bowel and is not intended to be used as a replacement for them.

The device is made by Given Imaging Ltd., an Israeli company with North American headquarters in Norcross, Ga.

Serious Product Problem? Report It

Health professionals can report serious adverse reactions or other product problems to the FDA’s MedWatch program by:

• Mail: Use the postage-paid MedWatch form, available from the FDA Web site or by calling the toll-free number below.
• Phone: 1-800-FDA-1088 (1-800-332-1088)
• Fax: 1-800-FDA-0178 (1-800-332-0178)
• Internet: www.fda.gov/medwatch/ Call the 800 number or visit the Web site for further assistance.

The FDA encourages consumers to report through their doctors, but if they prefer, they may submit the MedWatch form themselves.
Drug Treatment Approved For Equine Neurological Disease

The FDA has approved Marquis (ponazuril), the first drug to treat equine protozoal myeloencephalitis (EPM). EPM is caused by a parasite (Sarcocystis neurona) and is the most commonly diagnosed neurological condition in horses in North and South America. In some areas of the United States, as much as 80 percent to 90 percent of the horse population may have been exposed to EPM. An estimated 1 percent of the horses exposed to the disease will develop clinical signs of EPM and require treatment.

The clinical signs may vary, and they may include weakness (particularly on one side), serious lack of coordination, and muscle wasting involving all four limbs. EPM is most often found in horses younger than 5 years old and in horses older than 13. Diagnosis of EPM is difficult, since there are at least four other central nervous system diseases in horses that can closely resemble the disease.

The FDA expedited the approval process for drugs to treat EPM in an effort to reduce the suffering and death associated with the disease, and because there were no approved therapeutics for treating this devastating illness.

Marquis is packaged as an oral paste to be given once at day for 28 days in adult horses. Bayer Animal Health, Shawnee Mission, Kan., is the manufacturer of the drug, which will be available by prescription only from a licensed veterinarian.

Joint Program Announced by FDA and NCI Holds Promise for Cancer Treatment

The FDA and the National Cancer Institute (NCI) have announced a new joint research and clinical program that holds great promise for developing better and more targeted treatments for cancer. The new program, called the Clinical Proteomics Program, unites the study of all proteins in living cells (proteomics) to the clinical care of patients for the first time.

“This new approach to treatment holds the potential to revolutionize cancer detection and care,” says Health and Human Services Secretary Tommy G. Thompson. “With this expanded collaboration, the FDA and NCI are employing powerful, new technologies they developed jointly.” The agency collaboration, which began in 1997, is led by Emanuel Petricoin, Ph.D., of the FDA’s Center for Biologies Evaluation and Research and Lance Liotta, M.D., Ph.D., of NCI’s Center for Cancer Research.

The new Clinical Proteomics Program, funded for three years with $1.1 million per year, relies on recently developed tools capable of rapidly scanning cells for hundreds of proteins at once. Petricoin and Liotta also have created new technologies to generate protein fingerprints that may provide early warning of drug side effects. In addition, they have already invented or refined several key technologies used in proteomic analysis.

“The great challenge now in proteomics research is to begin to apply these technologies to clinical care,” says Petricoin. “We hope to take these techniques out of the lab to assess their benefit for people with cancer, in a true bench-to-bedside clinical research program.”

“The potential payoffs for this program are great,” says Liotta. “Everything we learn while refining these cutting-edge technologies will benefit cancer patients and the people trying to help them.”

Potential benefits of the joint program include:
• developing individualized therapies using targeted treatments that have been predetermined to be effective for each patient;
• determining the toxic and beneficial effects of treatments first in the lab before using them in patients;
• diagnosing cancer earlier than is now possible; and
• improving the understanding of tumors at the protein level, leading to better treatments.

Petricoin and Liotta have identified more than 130 proteins in cancers of the breast, ovary, prostate, and esophagus that change in amount as the cells in these tissues grow abnormally, which may provide new means of diagnosing and treating cancers earlier.

The new FDA-NCI collaborative program, announced in July, is the first step in moving these techniques out of the laboratory and into clinical settings for the benefit of patients. Cells from cancer patients at the National Institutes of Health are extracted before and after treatment with the aid of a special microscope invented in Liotta’s laboratory. The microscope allows researchers to isolate normal cells, pre-cancerous cells, and tumor cells from the same patient. By capturing cells directly from tissue, the original protein pattern of the cells is maintained, which is not the case with traditional methods of isolating cells.

Next, the scientists analyze the patterns of proteins in the extracted tumor cells after the patient has been treated. For example, the researchers are trying to determine how a particular treatment changes the pattern of the proteins in a cell or whether the protein patterns change if the tumor returns after treatment.

The NCI has recently begun clinical trials using proteomics to help make decisions about the course of the patients’ experimental treatments.
Special NIH Review Confirms Condoms Effective Against Transmission of HIV, Gonorrhea

A special review panel led by the National Institutes of Health has concluded after examining existing research that male latex condoms can effectively reduce transmission of HIV and gonorrhea. However, the panel’s report also said that there isn’t enough information from well-designed studies to determine how effective condoms are in preventing most other sexually transmitted diseases (STDs).

The report confirms that correct and consistent use of condoms can reduce the risk of HIV transmission. Epidemiological studies also indicate that condoms can prevent men from acquiring gonorrhea from a female partner, the report says. HIV is the virus that causes AIDS. The report, released on July 20, concluded that, because of limitations in study designs, epidemiological evidence currently is insufficient to “draw definite conclusions” about the effectiveness of condoms in preventing spread of chlamydial infection, syphilis, chancroid, trichomoniasis, genital herpes and human papillomavirus (HPV) infection.

The panel said that “the absence of definitive conclusions reflected inadequacies of the evidence available and should not be interpreted as proof of the inadequacy or inadequacy of the condom to reduce the risk of STDs.” The panel also recommended that more research be done.

The National Institutes of Health, the Centers for Disease Control and Prevention, the Food and Drug Administration, and the U.S. Agency for International Development organized a workshop in June 2000 to review the current research. Twenty-eight experts analyzed more than 138 peer-reviewed, published studies on the use of the male latex condom during penile-vaginal intercourse.

Analysis of combined data from several studies on related research questions showed an 85 percent decrease in risk of HIV transmission among consistent condom users versus non-users. These data provide compelling evidence that consistent use of the latex male condom is a highly effective method for preventing HIV transmission, the report said. Studies also show a 49 percent to 100 percent reduction in risk of gonorrhea among men reporting condom use compared with non-users.

For HPV, the panel found there was no evidence that condom use reduced the risk of HPV infection, but study results suggested that condom use might afford some reduction in risk of HPV-associated diseases.

STDs, including HIV infection, affect more than 65 million people in the United States. Many STDs can cause infertility and problems with pregnancy, and can be passed from a mother to her infant. Long-term infection with HPV can cause cervical cancer if not diagnosed (through annual pap smears) and treated. In addition, most STDs increase the likelihood of transmitting HIV infection at least 2- to 5-fold. Most STDs can be treated successfully.


Caution Issued on Hormone Replacement Therapy

Physicians have been advised against prescribing hormone replacement therapy (HRT) for the sole purpose of preventing heart attacks and strokes in women who already have cardiovascular disease. The recommendations were published in the July 24, 2001, issue of Circulation: Journal of the American Heart Association.

The new position is based on recent scientific studies about the role of HRT in reducing the risk of coronary heart disease in postmenopausal women. For postmenopausal women who have had a heart attack or stroke, the guidelines recommend that HRT not be initiated for secondary prevention. This recommendation is based, in part, on results of the Heart and Estrogen Replacement Study (HERS), a large-scale study that found no benefit of HRT among women with heart disease.

For preventing a first heart attack or stroke, the association recommends reducing risk factors such as high cholesterol and blood pressure through lifestyle changes and, if needed, with medications. Pending the results of ongoing studies, the guidelines recommend that the decision on HRT use be based primarily on non-heart related benefits and risks.

For women with diagnosed cardiovascular disease who are undergoing long-term hormone replacement therapy, the decision to continue or stop HRT should be based on established non-coronary benefits and risks, as well as patient preference.

Lori Mosca, M.D., Ph.D., lead author of the American Heart Association science advisory, titled “Hormone Replacement Therapy and Cardiovascular Disease,” said that the established benefits of HRT for the treatment of menopausal symptoms, such as hot flashes and osteoporosis prevention, must be weighed against risks for blood clots, gallbladder disease, and a possible increased risk of breast cancer.

“The new guidelines recommend essentially taking HRT out of the risk-benefit equation for women who have already had a heart attack or stroke,” Mosca said. “For postmenopausal women without heart disease, we do not suggest that HRT be taken completely out of the equation. We state that heart disease prevention should not be used as the sole purpose of therapy.”

Cardiovascular diseases, which include heart attack and stroke, are the leading causes of death in women. After menopause, risk for these diseases rises sharply.
West Nile Virus Infection May Be Greater Than Previously Thought

West Nile virus was recognized in the Western Hemisphere for the first time in 1999, when it caused an epidemic of encephalitis and meningitis in New York City. Intensive hospital-based, public health surveillance registered seven deaths in the region from meningoencephalitis (inflammation of the brain and spinal cord).

A detailed analysis of the New York City outbreak suggests that a substantial—and previously undiagnosed—number of West Nile fever cases accompanied the 59 cases of potentially deadly West Nile meningoencephalitis seen during the outbreak, researchers say.

West Nile virus was first isolated in the West Nile District of Uganda in 1937. According to the Centers for Disease Control and Prevention (CDC), most infections are mild with symptoms such as fever, headache, and body aches. People older than 50 are at highest risk of severe disease, which may result in a number of symptoms, including high fever, disorientation, muscle weakness, and rarely, death.

The New York City Department of Health and the CDC conducted a household-based survey in October 1999, about six weeks after the outbreak in New York. Investigators used a representative sample of households in an area surrounding the center of the outbreak. Blood samples were taken and tested for antibodies specific for the West Nile virus.

The study, published in the July 28, 2001, issue of The Lancet, concluded that for every diagnosed case of meningoencephalitis, there were likely to be 140 other infections, including 30 individuals with an influenza-like illness. Six hundred and seventy-seven individuals from 459 households took part in the survey. Nineteen (2.6 percent) were seropositive, which means they had the virus confirmed by blood test; about a third of these individuals (31 percent) reported a recent febrile illness, compared with 70 of 648 (11 percent) who were seronegative. A febrile syndrome with fatigue, headache, muscle pain, and painful joints was highly associated with the virus.

The investigators conservatively estimated that the New York outbreak consisted of about 8,200 (range 3,500-13,000) West Nile viral infections, including about 1,700 febrile infections. The risk of severe illness was higher among older people, with one case for every 50 infections in those aged 65 years and over, compared with one case for every 300 infections in people younger than 65.

Use of DEET-containing mosquito repellent was protective of infection in those who spent two or more hours outdoors between dusk and dawn, the peak biting period for West Nile virus-carrying Culex mosquitoes. But 70 percent of residents reported never using mosquito repellent even after the outbreak was recognized.

The CDC recommends eliminating standing water from around your home to avoid mosquito bites and reduce the risk of contracting West Nile virus.

Largest-Ever Prostate Cancer Prevention Trial

Healthy men are being sought for the largest-ever prostate cancer prevention study. The National Cancer Institute (NCI) and the Southwest Oncology Group (SWOG) have launched the Selenium and Vitamin E Cancer Prevention Trial, known as SELECT.

The goal of the research is to determine if selenium and vitamin E can protect against prostate cancer, the most common form of cancer in men after skin cancer. More than 400 sites in the United States, Puerto Rico, and Canada are recruiting participants for SELECT, which will include 32,400 men and take up to 12 years to complete.

It’s the first study designed to look specifically at the effects of vitamin E and selenium, both separately and together, in preventing prostate cancer. Previous research on other kinds of cancer suggests these nutrients might prevent prostate cancer. Selenium and vitamin E, both naturally occurring nutrients, are antioxidants. They are capable of neutralizing toxins known as “free radicals” that might otherwise damage the genetic material of cells and possibly lead to cancer.

During 2001, prostate cancer will be diagnosed in about 198,100 Americans, and more than 31,500 men are expected to die of the disease. Risk factors for the disease include being older than 55, African American, or having a father or brother with prostate cancer.

According to the NCI, it is crucial for men of all races and ethnic backgrounds to participate in SELECT. African American men, who have the highest incidence of prostate cancer in the world, are especially encouraged to join the trial. Prostate cancer also strikes African Americans at a younger age, so they are eligible to enroll in the study at age 50 rather than the age 55 minimum set for men of other racial and ethnic backgrounds. There is no upper age limit for participation in SELECT.

In addition, SELECT participants must have never had prostate cancer or any other cancer—except non-melanoma skin cancer—in the last five years, and must be in generally good health.

For more information on SELECT and participating centers, call the NCI’s Cancer Information Service at 1-800-422-6237 (English and Spanish). Callers with TTY equipment may call 1-800-332-8615. When calling from Canada, contact the Canadian Cancer Society’s Cancer Information Service at 1-888-939-3333 (English or French). Visit the NCI’s Web site at http://cancer.gov/select or SWOG’s web site at http://swog.org and choose SELECT.
Agencies Team Up In War Against Internet Health Fraud

By Linda Bren

...cures Alzheimer's and HIV/AIDS
...proven effective in treating over 650 infectious diseases
...recognized in scientific journals to be a revolutionary breakthrough in treating arthritis

These health product claims found on the Internet can provide hope for those suffering from painful or debilitating diseases. But they are false claims, leading to false hopes. They are also fraudulent, illegal, and the cause of recent government enforcement actions against the companies that made them.

In the ongoing war against Internet health fraud, federal and state government organizations have united, in an effort dubbed Operation Cure All, to crack down on unscrupulous marketers who use the Internet to prey on the sickest and most vulnerable consumers.

Operation Cure All, a partnership of the Federal Trade Commission, the Food and Drug Administration, Health Canada (the Canadian federal health department), and various state attorneys general and state health departments, combines a law enforcement effort with a consumer education campaign.

Almost 100 million adults in the United States use the Internet to find health-related information, according to a poll conducted by the market research firm Harris Interactive. "The Internet provides many benefits. But, its unique qualities—including its broad reach, relative anonymity, and ease of creating new Web sites or removing old ones—pose new enforcement challenges," says Bernard A. Schwetz, D.V.M., Ph.D., acting principal deputy commissioner of the FDA. "FDA and the FTC are working together to protect the public from those who try to take advantage of consumers through this new technology."

In June, the FTC, which developed and leads Operation Cure All, announced enforcement actions against six companies that fraudulently marketed health products on the Internet. These actions mark Operation Cure All's fourth group of targeted enforcement efforts to address marketing of unproven health products on the Internet.

Five of the companies have agreed to settle the charges. Settlements included such actions as removal of all unsubstantiated claims for products, warnings about potential dangerous interactions with some prescription drugs, a notice to purchasers with an offer for a full refund, and agreement to pay fines for consumer redress. The FTC has filed a complaint in federal district court against the sixth company.

Among the many false and unsubstantiated claims challenged in these recent cases were promises that:
• People could cancel their surgery, radiation or chemotherapy in favor of herbal cures that cost hundreds of dollars;
• A device that delivered mild electric current would kill the parasites that cause such serious diseases as cancer and Alzheimer's; and
• Those with HIV or AIDS could use St. John's wort as a safe treatment for the disease. (The FDA and FTC warn that St. John's wort may have potentially dangerous interactions with other medications, including some proven HIV/AIDS medications.)

"It's bad enough when someone, with little or no evidence, touts unproven remedies to vulnerable populations such as people infected with HIV or AIDS," says Walter H. Carr, partnership council chairman of the National AIDS Health Fraud Task Force.

How to Report Suspicious Claims

The FTC and FDA encourage people to report suspicious health claims. Since January 2000, the FDA has checked out more than 3,000 tips submitted by consumers about suspicious online prescription Web sites, according to Tom McGinnis, R.Ph., the FDA's director of pharmacy affairs.

To file a complaint regarding a possible fraudulent, deceptive, or unfair business practice, call toll-free, 1-877-FTC-HELP (1-877-382-4357), or use the complaint form at www.ftc.gov.

If you find a Web site you think is illegally selling human drugs, animal drugs, medical devices, biological products, foods, dietary supplements, or cosmetics over the Internet, use the complaint form at www.fda.gov/oc/buyonline/buyonlineform.htm.

—L.B.
Be Suspicious

Promoters of fraudulent health-care products often use similar claims and practices to lure consumers into buying their goods. The FTC and FDA advise consumers to be suspicious of:

• Claims that the product is “natural” or “non-toxic,” suggesting it does not have side effects. “Natural” or “non-toxic” does not necessarily mean safe. Some “natural” supplements contain potent stimulants; others can result in negative interactions with medicines.
• Testimonials from people who claim amazing results. Testimonials often are undocumented and are not a substitute for scientific proof.
• Claims that a product is a “scientific breakthrough,” “miraculous cure,” “secret ingredient” or “ancient remedy.”
• Claims that the product is an effective cure for a wide range of ailments.
• Claims that use impressive-sounding medical terms.
• Claims that the product is available from only one source, and payment is required in advance.
• Claims of a “money-back” guarantee.
• Web sites that fail to list the company’s name, physical address, phone number or other contact information.

—L.B.

Force Network. “It’s even more frightening when they do so despite—and without so much as a mention of—emerging risks that those remedies pose to the very people to whom they are pitching their sale. St. John’s wort and protease inhibitors: They don’t mix.”

Since the launch of Operation Cure All in 1999, the FDA and FTC have won a number of battles against Internet health fraud. The FDA’s efforts to curtail online marketing of unapproved drugs have resulted in at least 12 product seizures, 11 product recalls, 43 arrests, and 22 convictions. The FDA continues to investigate more than 80 incidences of Internet health fraud and unapproved drug products.

Since 1999, the FTC has brought 13 law enforcement actions against Internet marketers for unsubstantiated health claims. One case resulted in a $1 million settlement with the maker of a shark cartilage product promoted as a cure for cancer. Another settlement required consumer refunds for electronic devices and herbal remedies that were sold as cures for cancer, AIDS, Gulf War syndrome, and many other diseases. All were required to remove their bogus claims from the Web. In addition, the FTC estimates that more than 100 other Web sites have taken down their sites or removed their claims after the FTC contacted them.

“Consumers should avoid Web sites that promise quick and dramatic cures for serious diseases,” says Howard Beales, director of the FTC’s Bureau of Consumer Protection. “And they should always consult a physician or other health-care professional before using any product or treatment.”

For More Information...

For tips on buying health-care products on the Internet, check out:

FTC’s Virtual Health Treatments
www.ftc.gov/healthclaims/

FDA’s Buying Medicines and Medical Products Online
www.fda.gov/oc/buyonline/

For safety and other information on dietary supplements, see:
www.cfsan.fda.gov/~dms/supplmnt.html

Diet, Exercise Delay

At least 10 million Americans at high risk for Type 2 diabetes can sharply lower their chances of getting the disease with diet and exercise, a major clinical trial indicates.

“In view of the rapidly rising rates of obesity and diabetes in America, this good news couldn’t come at a better time,” said Health and Human Services Secretary Tommy G. Thompson in announcing the findings Aug. 9 at the National Institutes of Health (NIH).

“So many of our health problems can be avoided through diet, exercise and making sure we take care of ourselves.”

The study also found that treatment with the oral diabetes drug Glucophage (metformin) reduces diabetes risk, though less dramatically, in people at high risk for Type 2 diabetes.

Participants who were randomly assigned to intensive lifestyle intervention reduced their risk of getting Type 2 diabetes by 58 percent. On average, this group maintained their physical activity at 30 minutes a day, with walking or other moderate-intensity exercise, and lost 5 percent to 7 percent of their body weight. Participants picked randomly to receive treatment with Glucophage reduced their risk of getting Type 2 diabetes by 31 percent.

The study, called the Diabetes Prevention Program (DPP), compared diet and exercise to treatment with Glucophage in 3,234 people with impaired glucose tolerance (IGT), a condition that often precedes diabetes. The trial ended a year early because the data had clearly answered the main research questions.

The DPP, conducted at 27 centers nationwide, is sponsored by the NIH. It is the first major trial to show that diet and exercise can effectively delay diabetes in a diverse American population of overweight people with IGT, a condition in which blood glucose levels are higher than normal but the individual is not yet considered to have diabetes.

Forty-five percent of the participants enrolled in the DPP were from minority groups that suffer disproportionately from Type 2 diabetes: African Americans, Hispanic Americans, Asian Americans and Pacific Islanders, and American Indians. The trial also recruited other groups known to be at higher risk for Type 2 diabetes, including people age 60 and older, women with a history of gestational diabetes, and people with a first-degree relative with Type 2 diabetes.

Lifestyle intervention worked as well in
men and women and in all the ethnic groups, according to the study’s chairman, David Nathan, M.D., of Massachusetts General Hospital in Boston. It also worked well in people age 60 and older, reducing the development of diabetes in this group by 71 percent. Glucophage was effective in men and women and in all the ethnic groups, but was relatively ineffective in the older volunteers and in those who were less overweight.

DPP volunteers were randomly assigned to one of the following groups:

- intensive lifestyle changes with the aim of reducing weight by 7 percent through a low-fat diet and exercising for 150 minutes a week;
- treatment with Glucophage (850 mg twice a day), a drug approved in 1995 to treat Type 2 diabetes; or
- a standard group taking placebo pills in place of Glucophage.

The latter two groups also received information on diet and exercise.

DPP participants ranged from age 25 to 85, with an average age of 51. Upon entry to the study, all had impaired glucose tolerance as measured by an oral glucose tolerance test, and all were overweight, with an average body mass index (BMI) of 34. (A BMI of 25 or more—or 27 after age 35—indicates obesity.) About 29 percent of the DPP standard group developed diabetes during the average follow-up period of three years. In contrast, 14 percent of the diet and exercise group and 22 percent of the Glucophage group developed diabetes.

Volunteers in the diet and exercise group achieved the study goal, on average a 7 percent—or 15-pound—weight loss, in the first year and generally sustained a 5 percent total loss for the study’s duration. Participants in this lifestyle intervention group received training in diet, exercise (most chose walking), and behavior modification skills.

Can the interventions prevent diabetes altogether? “We simply don’t know how long, beyond the 3-year period studied, diabetes can be delayed,” says Nathan. “We hope to follow the DPP population to learn how long the interventions are effective.”

The researchers will analyze the data to determine whether the interventions reduced cardiovascular disease and atherosclerosis, major causes of death in people with diabetes.

Human Research Reinstated at Johns Hopkins, With Conditions

By Linda Bren

Human medical research at Johns Hopkins University in Baltimore resumed in July under strict conditions and federal monitoring following the June 2 death of a healthy 24-year-old woman who was part of an asthma study at the school.

Federal investigators uncovered multiple violations of federal research requirements and suspended nearly all federally funded human research studies at the university except for those that were determined to be “in the best interests of individual subjects.” These included studies that had potential benefit for participants being treated for fatal diseases. Hopkins also agreed to suspend all studies not federally funded but regulated by the Food and Drug Administration, and the institution took full responsibility for the death of Ellen Roche, a healthy lab technician and study participant.

The Department of Health and Human Services’ Office for Human Research Protections (OHRP) reinstated most human research studies three days after the July 19 suspension. The OHRP oversees all federally funded research studies; the Hopkins study was funded by the National Institutes of Health.

Roche’s death occurred about a month after she inhaled the drug hexamethonium. The experimental drug is a lung irritant and is not approved by the FDA. Hopkins researchers used the drug to test the way healthy lungs work to fight restricted airways occurring in people with asthma or other impaired breathing conditions.

Based on a coordinated investigation by the FDA and OHRP, violations were found involving both the study investigators and the Institutional Review Boards (IRBs), which serve to conduct ethical reviews of studies involving human research participants. The IRBs were cited for inadequate review of study design and failure to provide continuing oversight of the asthma study. The FDA also identified violations involving the lead researcher at Hopkins, Alkis Togias, M.D., including inadequacies in the consent forms given to study participants, failure to report side effects of the hexamethonium used in an earlier patient, and use of a drug unapproved for humans.

“The researchers should have consulted us on their intent to use the drug,” says David Lepay, M.D., senior adviser for clinical science at the FDA. “We would have reviewed toxicity data and required that the consent form notify participants that this was a research study of an unapproved drug used in a way where there might be unknown risks.”

The OHRP required a corrective action plan from Hopkins telling how it will address the violations and restructure its system for protecting human subjects. In its plan, Hopkins said it would create additional IRBs, educate IRB members and researchers in human subject protection, and provide study participants with a detailed and easy-to-understand consent form that lists all potential study risks.

With more than 2,000 experiments underway, Johns Hopkins is the largest recipient of federal research funding in the United States.

“Human studies play a vital role in drug development,” says Lepay. “We must strive to promote continued advances in medicine through high-quality studies conducted safely and with the highest ethical standards.”
An Interview With Joseph A. Levitt
Americans enjoy one of the safest food supplies in the world. Despite that fact, diseases caused by food in the United States are responsible for an estimated 76 million cases of gastrointestinal illnesses, 325,000 illnesses resulting in hospitalizations, and 5,000 deaths each year, according to the Centers for Disease Control and Prevention.

As director of the Food and Drug Administration’s Center for Food Safety and Applied Nutrition (CFSAN), Joe Levitt is responsible for directing programs aimed at ensuring the safety of the nation’s food supply. Under Levitt’s leadership, CFSAN is responsible for a wide range of other programs, including food and color additives, food and nutrition labeling, dietary supplements, and cosmetics.

Levitt and the nearly 900 CFSAN scientists, researchers, regulatory personnel, and support staff oversee products that account for nearly 80 percent of what Americans spend on food. Levitt recently discussed food safety and other current topics such as bioengineered foods and imports with FDA Consumer.

Q: Food safety remains a top priority with the Center for Food Safety and Applied Nutrition. What are the major accomplishments in the center’s food safety program? Where are the center’s food safety resources focused?

A: When I first took this job three and a half years ago, I said our top priorities would be: food safety, food safety and food safety. If you compare where we are today on food safety to just three or four years ago, you will see that we’ve made fundamental changes that increase consumer protection.

Food safety is a compelling public health issue. As part of the Department of Health and Human Services (HHS), the FDA’s food safety programs affect every American, every single day.

The FDA and the Centers for Disease Control and Prevention (CDC) within HHS, along with the U.S. Department of Agriculture and our state and local counterparts, have worked to significantly strengthen the food safety system in the United States. Together, we have implemented stronger prevention programs, new surveillance systems, faster outbreak response, risk-based research and risk assessment, and expanded education programs.

Virtually everything we do in the food safety program has a strong scientific underpinning. We work hard to make our policies data-driven and science-driven so that they stand the test of time. Our credibility comes, in large part, from the fact that objective, scientific evidence will lead us in the right direction.

Prevention is the foundation of our food safety program. The FDA has put several new prevention programs in place. We now have prevention programs for seafood, juice, fresh fruits and vegetables, and sprouts, and we are developing one for eggs. But, we also realize that prevention efforts will never be able to eliminate all diseases caused by food. Therefore, with our federal and state partners, we’ve put into place a much faster and more effective system of early detection and containment that we call “outbreak response.” If there is an outbreak of foodborne illness, we now are able to jump on that case much more quickly—much more effectively—and save lives.

Probably the single most significant scientific achievement in food safety over the last five years is something that’s referred to as DNA fingerprinting. What that means is we now have the scientific tools to take a sample from one patient, and see if the bacteria’s DNA “fingerprint” matches that of another patient, or food, to identify a common source of infection. In other words, DNA fingerprinting speeds the “detective work” to determine when an outbreak has occurred. This enables us to more quickly respond to the outbreak, and prevent more people from getting sick. DNA fingerprinting is literally saving lives. The CDC has been instrumen-
In terms of resources, we have redirected our entire field inspection force to really focus on those food products that present consumers with the greatest risk for contamination with potentially harmful bacteria. Starting this year, we are conducting annual inspections of every company in the United States that makes one of these high-risk products so that we can ensure that prevention procedures are adequate and in place. This same strategy applies to imported food that arrives at U.S. borders. We conducted a survey of 1,000 samples of imported fruits and vegetables to identify which products were at highest risk for contamination. We then targeted our border surveillance to those high-risk products. We are now following up with a similar survey of domestic fruits and vegetables to help target our efforts inside the United States.

The bottom line is we are focusing on the highest risks, and we are targeting our efforts to be sure that we have them focused on where they do the most good for the American consumer.

Q: Despite the stringent measures already taken to protect people and cattle from “mad cow disease,” some say that more needs to be done to keep nervous system tissue from affected cattle out of the U.S. food supply. Is the FDA considering additional steps to ensure that foods remain free from prion contamination?

A: While we have no evidence that bovine spongiform encephalopathy, commonly called “mad cow disease,” is in the U.S. cattle herd, all of us must stay vigilant to be sure that we keep it out of this country.

“While we have no evidence that ‘mad cow disease’ is in the U.S. cattle herd, all of us must stay vigilant to be sure that we keep it out of this country.”

tal in converting this new technology into a nationwide surveillance system called “Pulse Net.”

In doing so, we decided to make changes that would further strengthen our program. Earlier this year, we proposed stronger regulations for food derived from biotechnology that would do two basic things: First, these regulations would require that all new foods derived from biotechnology be reviewed by the FDA before they go on the market. While this has been occurring on a voluntary basis, we want to be sure that the public wants to make sure that the government is looking out for them and scrutinizing these products to ensure their safety. That’s a legitimate issue. What we’ve done at the FDA is gone back and looked at our processes in light of that feedback.

Q: Despite persistent concerns about bioengineered crops, they are spreading so rapidly that it has become nearly impossible for consumers to avoid them. What steps is the FDA taking to ensure that bioengineered foods and animal feeds are as safe as their conventional counterparts?

A: The issue of bioengineered foods certainly has captured the public’s attention over the last couple of years. In fact, there was so much interest that the FDA decided to hold three public meetings around the country on this issue. I chaired one of those meetings and we got a lot of feedback from them. I think the bottom line is that the public wants to make sure that the government is looking out for them and scrutinizing these products to ensure their safety. That’s a legitimate issue. What we’ve done at the FDA is gone back and looked at our processes in light of that feedback.

Q: The FDA recently issued a health alert suggesting that pregnant women...
and women of childbearing age avoid four species of fish—swordfish, king mackerel, shark and tilefish—because of potential methylmercury contamination. Fish and seafood are an important part of a healthy diet. What steps have been taken by the FDA to ensure seafood is safe to eat?

A: The first prevention program put into place by the FDA was aimed at seafood safety. It's called Hazard Analysis and Critical Control Point or HACCP (há-sip). HACCP focuses on identifying and preventing hazards that could cause foodborne illness rather than relying simply on spot-checks of manufacturing processes or end-product testing. What this means is that seafood processors need to evaluate their systems and see where the real sources of contamination are. They should ask themselves: What are the potential hazards? Where are the "critical points" that need controls to limit those hazards? Then they must put in place a monitoring program to ensure that the hazards are, in fact, being properly controlled.

HACCP is the cornerstone of our science-based, modern food safety system. It actually is based on a system developed for NASA to ensure safe food for astronauts. After the FDA put in place HACCP for seafood, the U.S. Department of Agriculture implemented a HACCP program for meat and poultry. And the FDA is putting HACCP in place next year for juice products. So this really is the cornerstone of a modern prevention system. That's the overview.

Now, what have we done recently? What we have found is, as with any program, it's good to start looking at the big picture—but then you've got to start homing in on where the biggest problems are. This year we issued what we called a "mid-course correction" to our seafood HACCP program. We wanted to be sure we were devoting our time to those seafood products that potentially—and I emphasize potentially—could create the most serious health problems for consumers. Those are seafood products that could contain either harmful bacteria or histamines that cause allergic-type reactions. We want to be sure we inspect processors of the "high risk" products more intensely and make sure they have adequate HACCP systems in place.

We also are focusing on areas where particular groups of consumers may be vulnerable. Along these lines we issued an alert this year for pregnant women and women of childbearing age who may become pregnant to avoid four kinds of seafood: shark, swordfish, king mackerel and tilefish. Those are the fish with the highest levels of methylmercury, a naturally occurring marine toxin. A steady diet that contains foods with high levels of methylmercury could have harmful effects on an unborn child. We're taking a "better safe than sorry" approach here. And we've tried to get a strong warning out to women who are pregnant, and to women of childbearing age who may become pregnant, to avoid these kinds of fish to protect their unborn children.

Methylmercury is a good example of how the breadth of the FDA's food safety program is expanding. While our food safety program over the last several years has focused on foodborne illness associated with bacteria, we are expanding the program to address chemical, environmental and physical hazards, as well. Typically, these hazards tend to be of a more chronic nature than bacterial hazards, but they are still very important.

Q: Imported foods, everything from Swiss chocolate to fresh produce from South America, continue to flow into the United States at ever-increasing rates. How does the FDA ensure that such foods are wholesome and of the same quality as domestically produced products?

A: Our goal in regulating imported foods is clear. We need to ensure that the consumer has the same level of protection and the same level of confidence in the food they eat, wherever its origin. A consumer shouldn't have to try to figure out which sources of food are safer than others. That's the government's job.

First, we need to realize that imported foods present a unique and special challenge to us. Over the last decade, there has been an enormous surge in the volume of food that is imported into the United States. You can now go to the grocery store, any month of the year, and have a variety of products to choose from. For example, you have fruits and vegetables year-round that you never had before. Consumers want this choice. And it's a good choice. Many of these foods are the types we encourage people to eat as part of a healthy diet. However, when more and more food is coming from all around the world, not only does the sheer volume of the food present a challenge, but it also introduces more potential sources of contamination. As the volume of imports increases, the percentage of imported foods we are able to inspect decreases. Currently, the FDA is actually only able to sample and test less than 1 percent of imported products. As I have already mentioned, that means we
have to target our efforts on those products that present the highest risk to consumers. The FDA has developed a computerized system over the last several years so that we are now able to quickly review import entries and identify products and/or countries where we’ve had trouble in the past. As I mentioned before, we’ve analyzed 1,000 samples of imported fruits and vegetables to see where the problems are, and so we’re targeting our resources where the greatest known risk is.

Second, we recognize that we can’t expect to catch everything at the border, so we are increasing our overseas presence. We are now conducting more on-site foreign inspections, again, focusing on those products that are at highest risk for contamination. We also are increasing our foreign food safety outreach and training programs. Our food safety experts have traveled literally around the world to teach growers and processors what is needed to meet our country’s high food safety standards. So far we’ve been to Central America, South America, the southern Pacific, and most recently to South Africa. We will also be going to the Far East.

There has been enormous interest in these international outreach activities. The good news is that companies that want to export to the United States know we have high standards and they want to meet those standards, and we’re doing our best to get the information to them on how to do that.

In summary, yes, there are a lot more imports. And yes, the growing volume of imports is a concern to us. That is why we are shoring up border surveillance and increasing our overseas presence.

Q: An estimated 6 million to 7 million Americans have food allergies. And about 150 people die each year in the United States from severe allergic reactions to food. What is the FDA doing to increase the awareness of food allergens among consumers and food processors?

A: This is a very important issue. I think we have to start by clearly stating the problem. There are a significant number of Americans who have food allergies.

"Probably the single most significant scientific achievement in food safety over the last five years is something that’s referred to as DNA fingerprinting."

About 90 percent of these food allergies are attributed to eight types of food: milk, eggs, fish, wheat, tree nuts, peanuts, soybeans and crustaceans (such as shrimp and crab).

A couple of years ago, we started to see an increase in product recalls due to the presence of food allergens in the product that were not included on the label. The rule is: If it’s in there, it’s supposed to be on the label so that allergic consumers can avoid them. We worked with the states of Minnesota and Wisconsin to survey food manufacturers. What that survey found really caught our attention. Twenty-five percent of the samples tested positive for peanut allergens, even though peanuts were not supposed to be there and were not declared on the product label. And 10 percent of the samples tested positive for eggs, although eggs were not declared in the label. That is a big problem.

A consumer with a food allergy is dependent on the food label. So those labels have to be reliable. As a result, we’ve taken a lot of steps to ensure that they are. And, just as important, the food industry has done a number of things, too, and they are to be commended for that. I think that everyone who looks at this problem says: This is something we need to fix. And the good news is that we can.

We have issued a document called a Compliance Policy Guide. It articulates very simple rules on food allergens for industry. If you have an ingredient that may cause a food allergy in your product, you have to label it. And, if you don’t label it, it should not be in there. By issuing this policy statement, we’re telling the industry very clearly that we’re going to be out there inspecting establishments to make sure that these rules are followed. We’ve also issued clear instructions to our field inspectors on what to look for from an allergen standpoint at food processing plants. The industry has followed suit and has developed their own code of practices for preventing cross-contamination with food allergens.

In conjunction with patient advocacy groups, the food industry has developed guidelines to simplify allergen labeling in the food ingredient statement. The idea behind this effort is to speak to consumers in “plain English.” If it is a milk-derived ingredient, for example, the ingredient statement will very clearly say “milk” ingredient rather than something like “casein” or “whey.” This tells a consumer allergic to milk not to eat it. Clearer labeling is a significant step up for consumers.

As soon as this issue emerged, everyone—whether on the industry side, the consumer side or the government side—agreed that food allergens are a real problem and that the problem needs to be addressed today. There really has been a lot of positive response and that’s good for consumers with food allergies.
Q: What else has the FDA done to improve the labeling of food?

A: One of the FDA’s greatest developments over the past decade was the development of the new food nutrition label. The label, which now appears on virtually all food products, gives consumers clear and reliable information on everything from calories, fat and sodium to protein and vitamins. That same principle of clear and reliable information to consumers is something we’ve applied to food labeling across the board. If there are claims of a health benefit in the labeling, we make sure that they are supported by good scientific studies and that they state clearly what the benefit is, without over-promising. It applies to clear information on food allergens, and, increasingly, it applies to safety information we want consumers to be aware of.

For example, a couple of years ago we required a warning on unpasteurized juice products after there was a series of illnesses and one death. We wanted to be sure that consumers were aware that our most vulnerable populations—children, the elderly, and persons with weakened immune systems—could be at risk of serious illness from consumption of juice that is not pasteurized.

Q: The FDA, as part of a cooperative effort with the Federal Trade Commission, Health Canada, and state attorneys general recently took action against several marketers who fraudulently sold dietary supplements and other “health” products on the Internet. What should consumers do to ensure that the health products they buy online are legal, safe and effective?

A: The Internet certainly has provided greater access to everything from information to products. That includes food products and dietary supplements regulated by the FDA. It is much more difficult for the agency to regulate products sold over the Internet. It’s harder to find where the marketers are. And if you are a marketer, it’s easier to close down one Web site and start up another than to close down one set of offices and reopen another. When necessary, we are taking action against products sold on the Internet that do not meet applicable requirements. We are also partnering with other federal agencies like the Federal Trade Commission and state agencies. But consumers need to do their part, too. The basic advice is: Do your homework. Talk to your health-care professional to make sure that the products you use are right for you. That’s true whether you’re buying a product on the Internet, at the grocery store, or at your local health food store.

Dietary supplements have a lot of positive uses but they also carry some potential risks, and every product isn’t appropriate for everyone. Consumers need to take responsibility for doing the proper research and for consulting with health-care professionals to ensure that the products they take are right for them. It’s also important for those who use supplements and take prescription drugs to tell their health-care provider what they’re taking because we’re starting to learn more about cross-reactions among different products. If you don’t tell your health professionals all of the drugs and supplements that you’re taking, they won’t be able to advise you correctly.

Q: What’s the biggest challenge that you and the staff at the Center for Food Safety and Applied Nutrition face each day?

A: The biggest challenge we face in an agency like the FDA is to be sure that we stay focused on those problems or issues that most directly benefit American consumers. Each year, our center sends out a call to consumer groups, industry groups, and to health-care groups, asking for input on what we should focus on during the next year. The central question is: Where do we do the most good for consumers? That’s how we stay focused. There are so many issues, and so many groups that want us to pay attention to their needs. We need to keep the consumer who lives next door first and foremost in our minds. That’s why we exist.

Q: What’s the take-home message?

A: First, that the world of food safety has fundamentally changed in many ways. The consumer has to change with it and the government has to change with it, too. Take computers for example. It’s obvious to everyone that the world of computers has changed—in barely a generation we’ve gone from electric typewriters to laptop computers and ready Internet access. Everybody can see that. The change in the food supply is much more subtle. It’s harder to see. But the changes are just as dramatic. We are now eating a greater variety of foods, particularly seafood and fresh fruits and vegetables that are eaten raw. On the one hand, these products are nutritious. On the other hand, these foods can introduce many more sources of potential contamination, since they are not cooked.

There also are many more kinds of harmful bacteria that can potentially contaminate our food. A physician from the American Medical Association said recently, “It’s not your grandma’s kitchen any more.” That’s true. Today, Americans get their food from all around the world, every month of the year. We also eat more food prepared outside the home where more and more food workers become involved in preparing our food, cooking our food, and serving our food. And when food is contaminated, there are many more people who are more susceptible to foodborne illness—pregnant women, the very young, the elderly, and those with impaired immune systems.

So we now have a food supply that has within it a whole different dynamic than the one we grew up with. People need to know that the world of food safety has changed. That means increased vigilance all around. Does that mean that people need to be scared? No. What it does mean is that people need to take proper precautions just like they do when they get into their cars and fasten their seatbelts. Our main consumer messages are: Keep your hands and cooking surfaces clean; cook food to proper temperatures; refrigerate food promptly; and separate foods to avoid cross-contamination—in other words, don’t put raw chicken on the cutting board just before you cut lettuce. “Healthy vigilance” for everyone involved should be the take-home message.
It was supposed to be a short course of treatment with tranquilizers after the death of her infant son 15 years ago. But Lynn Ray, 46, of Germantown, Md., says her abuse of the anti-anxiety drug Xanax and other prescription drugs led to a long struggle with addiction that nearly ruined her life.

Tranquilizers, which slow down the central nervous system and cause drowsiness, numbed Ray’s agony, helped her sleep, and untied the relentless knot in her stomach. Soon, even if her doctor had prescribed one pill in an eight-hour period, she took two or three in an attempt to intensify the calming effect of the drug.

When the doctor stopped writing prescriptions for her and encouraged grief counseling, Ray began doctor-shopping—going from doctor to doctor, fabricating panic attacks, backaches, migraines, and other ailments that would get her multiple prescriptions for tranquilizers and pain killers. “I became a very good actress,” Ray says. “I thought I needed these drugs no matter what, even if I had to bamboozle the doctors to get them.”

Most patients take medicine responsibly, but approximately 9 million Americans used prescription drugs for non-medical purposes in 1999, according to the National Institute on Drug Abuse (NIDA). Non-medical purposes include misusing prescription drugs for recreation and for psychic effects—to get high, to have fun, to get a lift, or to calm down.

Experts stress that prescription drug abuse isn’t about bad drugs or even bad people. It involves a complex web of factors, including the power of addiction, misperceptions about drug abuse, and the difficulty both patients and doctors have discussing the topic.

There is also the delicate balance of curbing criminal activity related to drug abuse while making sure that people with legitimate health needs can still access...
“I will always know in my heart that I could have killed those people.”

Care, says Alan I. Leshner, Ph.D., director of NIDA. “We recognize the very real issue that millions of lives are improved because of prescription drugs—the same drugs that are sometimes abused,” he says.

**Consequences of Abuse**

Ray had convinced herself that abusing prescription drugs was safer than abusing heroin, marijuana, and other “street drugs.” “I would never do those,” she says. “I figured I had a prescription for what I was doing, which made it OK.”

Scott Walker, program director for substance abuse at the Mountain Comprehensive Care Center in Prestonsburg, Ky., says he hears that rationalization over and over. “Some people tell themselves they’re not using something old Joe cooked up in a garage somewhere,” Walker says. They may figure a legitimate manufacturer made this, “so what could be the harm?”

As Ray’s life unraveled, she found out the harm can be great, whether you’re using heroin or sleeping pills. She lost her job as a computer programmer after repeatedly showing up late for work and falling asleep at her desk. Her son, a pre-teen at the time, couldn’t understand her erratic behavior and didn’t want anything to do with her.

Then in 1995, she crashed her car three times in one month while under the influence of tranquilizers and painkillers, seriously injuring others each time. Her driver’s license was revoked, and she served a one-year jail sentence in 1998. “I will always know in my heart that I could have killed those people,” she says. “It doesn’t matter that I didn’t kill them; it matters that I could have.”

Walker says that roughly half of the people undergoing substance abuse treatment at Mountain Comprehensive Care Center come after realizing that they found themselves in a hole too deep to get out of on their own. The other half, like Ray, come because of some criminal charge related to drug possession or drug use.

OxyContin (oxycodone), a controlled drug approved in 1995 to treat chronic, moderate-to-severe pain, has received considerable attention because of deaths and crimes associated with its abuse. (For more on the classes—or schedule—of drugs, see “Controlled Substances” on page 23.) OxyContin is a morphine-like narcotic that contains a high dose of oxycodone. Manufactured by Purdue Pharma, Stamford, Conn., the drug was originally believed to pose a lower risk for abuse because it is a controlled-release drug designed to be taken orally and swallowed whole, says Deborah Leiderman, M.D., director of the Food and Drug Administration’s controlled substance staff. The drug’s active ingredient, oxycodone, is slowly released over a 12-hour period. “But the safety of the drug is based on taking the drug exactly as intended,” she says.

Abusers sometimes disrupt the time-release formula of the drug to speed up absorption, often chewing the tablets, crushing them and snorting the powder, or dissolving them in water and injecting the drug to get a fast high. Abusers have also used OxyContin with other painkillers, alcohol, and marijuana. Several deaths have resulted, mostly in rural areas of the Eastern United States, especially in Virginia and West Virginia.

Other products containing oxycodone such as Percodan and Percocet have also been abused over the years. Abuse of opiates is not new; what’s new is the recent surge in local epidemics of opiate abuse (see “Most Commonly Abused” on page 24).

The most highly abused stimulants are illicit drugs, including cocaine and methamphetamine. There also have been recent reports of Ritalin (methylphenidate) abuse among middle and high school students. The drug, which produces effects more potent than caffeine and less potent than amphetamine, is prescribed to treat attention-deficit/hyperactivity disorder and other conditions. But some have used it to suppress their appetite or to stay awake while studying. The DEA lists Ritalin as a “drug of concern” and reports that some abusers have dissolved the tablets in water and injected the mixture, which can block small blood vessels and damage the lungs and retina of the eye.

**Complexities of Addiction**

It’s not that potentially addictive medications shouldn’t be used, says Richard Brown, M.D., M.P.H., associate professor of family medicine at the University of Wisconsin Medical School. “They have an important place in the treatment of debilitating conditions.” According to NIDA, drug addiction—characterized by drug craving that is out of control—is actually uncommon among people who use drugs as prescribed.

NIDA, along with several health organizations, has launched a national initiative to educate the public about the dangers of the non-medical use of prescription drugs, and the potential for abuse and addiction. With psychological addiction, there is a preoccupation with obtaining and using drugs that persists despite the consequences. Psychological addiction is distinct from physical dependence and tolerance, but the presence of these problems can complicate the treatment of addiction, says Alice Young, Ph.D., a professor in the department of psychology at Wayne State (Continued on page 22)
It's not that potentially addictive medications shouldn't be used. They have an important place in the treatment of debilitating conditions.

**FDA Strengthens Warnings for OxyContin**

Because of continuing reports of abuse, the FDA has strengthened the warnings and precautions sections in the labeling of OxyContin controlled-release tablets, a narcotic drug approved for the treatment of moderate to severe pain. Some of these reported cases have been associated with serious consequences, including death.

OxyContin contains oxycodone HCl, an opioid agonist with addiction potential similar to that of morphine. Opioid agonists act by attaching to specific proteins called opioid receptors, which are found in the brain, spinal cord, and gastrointestinal tract. When these drugs attach to certain opioid receptors in the brain and spinal cord, they can effectively block the transmission of pain messages to the brain.

OxyContin is a controlled substance in Schedule II of the Controlled Substances Act (CSA), which is administered by the Drug Enforcement Administration (DEA). Schedule II provides the maximum amount of control possible under the CSA for approved drug products. (For more on the classes—or schedule—of drugs, see “Controlled Substances” on page 23.)

To educate health-care providers about the risks of OxyContin, Purdue Pharma of Stamford, Conn., manufacturer of the product, has issued a warning in the form of a “Dear Health Care Professional” letter, which will be distributed to physicians, pharmacists, and other health-care professionals. The letter highlights the problems associated with OxyContin abuse and explains the changes to the labeling, including proper prescribing information.

OxyContin, like morphine, has a high potential for abuse. It is supplied in a controlled-release dosage form and is intended to provide up to 12 hours of relief from moderate to severe pain. The tablet must be taken whole and only by mouth. When the tablet is crushed and its contents are injected intravenously or snorted into the nostrils, the controlled release mechanism is defeated and a potentially lethal dose of oxycodone is released immediately.

The FDA has worked with Purdue to make specific changes to the OxyContin labeling. The new labeling is intended to change prescription practices, as well as increase the physicians' focus on the potential for abuse and misuse. Changes include a “black box warning,” the strongest type of warning for an FDA-approved drug. The new warnings are intended to lessen the chance that OxyContin will be prescribed inappropriately for pain of lesser severity than the approved use or for other disorders or conditions inappropriate for a Schedule II narcotic.

The FDA-approved use for OxyContin is for the treatment of patients with moderate to severe pain who are expected to need continuous opioids for an extended time. An important factor that must be considered in prescribing OxyContin is the severity of pain that is being treated, not simply the disease causing the painful symptoms.

The FDA continues to recommend that appropriate pain control be provided to patients who are living with severe pain. Although abuse and misuse are potential problems for all opioids, including OxyContin, opioids are very important treatment options for pain management when used appropriately under the careful supervision of a physician.

Because of the ongoing problem of OxyContin abuse and diversion, the FDA has met with the DEA, the Substance Abuse and Mental Health Services Administration, the National Institute on Drug Abuse, Purdue Pharma, and others. The FDA will continue to monitor reports of abuse and misuse of OxyContin and other opioids, and will work with other federal agencies and drug manufacturers to help ensure that these important drugs remain available to appropriate patients.

Because opioids are subject to abuse, the FDA is encouraging all manufacturers of opioids sold in the United States to review voluntarily, and revise as necessary, their products' labeling to provide adequate warnings and precautions regarding these risks and to promote responsible prescribing practices.

For more information, patients and health-care providers can call Purdue Pharma at 1-800-745-7445, or go to the FDA's Web site at www.fda.gov/cder/drug/infopage/oxycontin/.
University in Detroit. “It is true that both psychological addiction and physical dependence can happen together,” she says, “but they are not the same.”

Young says that physical dependence, which is sometimes unavoidable, develops when an individual is exposed to a drug at a high enough dose for long enough that the body adapts and develops a tolerance for the drug. This means that higher doses are needed to achieve a drug’s original effects. “If the patient stops taking the drug, then withdrawal will occur,” Young says.

But the development of physical dependence doesn’t necessarily lead to addiction in all cases, she explains. “It means that the individual can’t just stop taking the drug; the dose has to be tapered,” a method to gradually decrease a drug’s amount over time to prevent withdrawal reactions.

In addition to promoting public education, NIDA’s initiative will foster new research on why certain people become addicted, says Leshner. “Some choose prescription drugs as the drug of choice, and others become addicted inadvertently,” he says. “We want to learn more about what makes some people more likely to stray from the prescribed plan than others.” NIDA also will support research into the mechanisms by which certain substances produce addiction.

Appropriate Use Is Key

Physician supervision and appropriate use is critical for all prescription drugs. Doctors consider a patient’s diagnosis and whether non-addictive treatments should be considered first.

“Very strong opiate drugs play a critical role in pain management,” FDA’s Leiderman says. “But they aren’t appropriate for all pain. Treatment needs to be tailored depending on a patient’s specific condition.”

Brown says doctors must also consider the patient’s medical history and whether an individual has had addictive disorders in the past. But a history of substance abuse doesn’t necessarily rule out using potentially addictive medications. “Patients should be honest about their substance abuse history because then it tells me to watch them even more closely,” Brown says.

A good rapport between a patient and doctor can make it easier to discuss problems that come up, and health-care professionals should carefully monitor patients who take potentially addictive medication. For some, that might require a periodic urine drug screen. Brown says. “This is not an issue of distrust or intrusiveness,” he says. “I explain to patients that it’s a way to help protect them, especially because people who are addicted may not recognize it. Addiction can make people do things they wouldn’t normally do.”

A couple of Brown’s patients experienced trouble with opioids and impulsivity—symptoms that led them to take more medicine than prescribed instead of waiting for the initial medicine to work. Brown picked up on the problems because both patients requested early refills. He switched them to non-drug treatments, such as physical therapy and relaxation techniques, until they could more successfully take prescription drugs.

Complicating matters is the fact that physicians are vastly undertrained in

Use Prescription Drugs Safely

1. Always follow medication directions carefully.
2. Don’t increase or decrease doses without talking with your doctor.
3. Don’t stop taking medication on your own.
4. Don’t crush or break pills.
5. Be clear about the drug’s effects on driving and other daily tasks.
6. Learn about the drug’s potential interactions with alcohol, other prescription medicines, and over-the-counter medicines.
7. Inform your doctor about your past history of substance abuse.
8. Don’t use other people’s prescription medications and don’t share yours.

—M.M.
Controlled Substances

The Controlled Substances Act categorizes drugs and substances into one of five schedules based on their medical use, abuse and addiction potential, and harmfulness. Schedule I drugs have the highest abuse potential. Heroin falls into the Schedule I category, drugs that have no accepted medical use in the United States. Schedule II drugs include OxyContin, morphine, and Ritalin. Schedule III drugs include anabolic steroids and Tylenol (acetaminophen) with codeine.

Legitimate handlers of controlled substances, such as hospitals and pharmacies, have to register with the Drug Enforcement Administration and use their registration numbers to purchase drugs. They must maintain complete and accurate records of all quantities manufactured, purchased, and sold. Drugs with higher abuse potential are subject to more restrictions than other drugs. For example, registered handlers must use a special order form to obtain Schedule II drugs. And orders for these drugs must be written and signed by practitioners and not phoned into the pharmacy except in an emergency. Prescriptions for Schedule II drugs also may not be refilled; patients have to go back to the doctor first. Those convicted of unlawful manufacturing, distributing, and dispensing of controlled substances face fines, prison sentences, or both.

Identifying Drug Abuse

"The average physician gets little training in drug abuse, mainly because drug abuse has only been recently recognized as a health problem," Leshner says. Brown says that some doctors are so concerned about penalties for overprescribing potentially addictive medications that they don't treat patients appropriately. "Other physicians mean well and prescribe the drugs, but don't know the warning signs of abuse," he says. "Then there are those who just can't say 'No' to patients who violate the prescribed plan."

One recent survey from the National Center on Addiction and Substance Abuse at Columbia University in New York City indicated that nearly half of primary care physicians report having difficulty talking about substance abuse with patients.

H. Westley Clark, M.D., J.D., director of the Center for Substance Abuse Treatment at the Substance Abuse and Mental Health Services Administration (SAMHSA), says his agency began a training program last year to help address this major problem.

The joint project with the Health Resources and Services Administration will train faculty members in the health professions. "It's not only for doctors," Clark says. "Other health professionals, including nurses and pharmacists, should also learn about recognizing the signs of substance abuse, talking about it, and knowing when patients should be referred for treatment."

There Is Help

For Ray, jail was the turning point. "There's something about those metal bars slamming shut behind you that makes it all very real," she says. A drug program in prison helped her beat addiction and taught her to cope with the triggers or life stressors that pushed her down the path to drug abuse.

"If you find yourself not following your doctor's orders, buying drugs off the street, or doctor-shopping, know that there is effective treatment and you can get help," Clark says. "If there is a treatment center within 100 miles of you, we can help you find it." (See "Treatment Centers," above.) Addiction is a brain disease typically treated with behavioral

Treatment Centers

The Substance Abuse Treatment Facility Locator covers more than 12,000 treatment centers. To find a treatment center in your state, visit http://findtreatment.samhsa.gov/facilitylocator.htm. Or call the locator's toll-free numbers: 1-800-662-HELP (1-800-662-4357), 1-800-662-9832 (Spanish), and 1-800-228-0427 (TDD line for those who are hearing impaired).
Most Commonly Abused

- **Opioids**: Also known as narcotic analgesics. Used to treat pain, opioids are the most commonly abused prescription drugs. Examples include morphine, codeine, OxyContin (oxycodone), Vicodin (hydrocodone) and Demerol (meperidine). In the short term, these drugs block pain messages and cause drowsiness. A large single dose can cause severe respiratory depression and death. Long-term use leads to physical dependence and, in some cases, addiction.

- **Central nervous system depressants**: Commonly used to treat anxiety, panic attacks, and sleep disorders. Examples are Nembutal (pentobarbital sodium), Valium (diazepam), and Xanax (alprazolam). They slow down normal brain function and can cause a sleepy, uncoordinated feeling in the beginning of treatment. Long-term use can lead to physical dependence and addiction.

- **Central nervous system stimulants**: Commonly used to treat the sleeping disorder narcolepsy and attention-deficit/hyperactivity disorder. Examples include Ritalin (methylphenidate) and Dexedrine (dextroamphetamine). These drugs, which can be addictive, enhance brain activity and increase alertness and energy. They elevate blood pressure, heart rate, and respiration. Very high doses can lead to irregular heartbeat and high body temperature.

—M.M.

intervention, drug treatment, or often a combination.

Some treatments need to alleviate both withdrawal symptoms and the psychological addiction to drugs. Detoxification, the process by which the body recovers from tolerance and dependence, is considered a first stage in the sense that it purges drugs from the body. “It doesn’t constitute a treatment,” Young says. “Treatment has to address stopping future use.”

Methadone, a synthetic opioid, has been used for more than 30 years to treat some opioid addictions. Levo-alpha-acetylmethadol (LAAM) is another opioid treatment.

With methadone treatment, the patient receives both behavioral intervention and an oral, daily dose that maintains the physical dependence. When people abuse drugs, they commonly use fast routes of administration such as injection or inhalation, which basically slam the drugs into the brain. Methadone treatment delivers the narcotic orally so that it is slowly released in the body. The intent is to lessen the chance that the patient will use illegal opioids, Young explains. Among the goals is to decrease cravings for the “rush” created when opioids are taken by fast routes, and to prevent the occurrence of withdrawal signs by maintaining a steady level of opiate in the body. “It’s a maintenance therapy over a long period of time, just like maintenance for diabetes, asthma, or any other chronic problem.”

**Striking a Balance**

Prescription drugs commonly are diverted through fraudulent prescriptions, doctor-shopping, over-prescribing, and pharmacy theft. Clark says that dealing with diversion requires the involvement of patients, physicians, and pharmacists, and that there are many variables linking these three groups.

“Sometimes it’s a matter of patients and physicians without adequate information about drug abuse,” Clark says. “Sometimes overworked pharmacies don’t notice when a patient is doubling up on a medication.”

But as pharmacists look out for false or altered prescription forms and doctors look out for suspicious complaints, patients with legitimate medical problems still need fair treatment, Clark says. “We don’t want to wind up punishing people in need.”

Ellen Stovall, president of the National Coalition of Cancer Survivorship, says some cancer patients have been frustrated with the lack of appreciation for assessment of their own pain. The last thing patients need is a setback to pain management, Stovall says. “We have all the important laws around the abuse of narcotics, but we need legislation and support to protect people who are experiencing real, honest suffering.”
Vision Correction
Taking A Look At What’s New

By Carol Lewis

Vision correction has come a long way since the 13th century when the first pair of spectacles was made by riveting together the handles of two magnifying lenses. Today, surgical developments in vision correction, as well as advances in traditional eyeglasses and contact lenses, can potentially improve a person’s vision to better than the optimal range of “20/20.”

It’s no surprise, then, that people dependent on glasses or contact lenses are visiting their eye-care specialists, hoping to find a quick fix for some age-old vision problems among the array of new techniques, products and technologies. Learning
about some of the common disorders that can threaten vision and how the eye "sees" can help you determine the best treatment to correct your vision. It's also important to understand the advantages, disadvantages, and limitations that come with vision correction procedures and aids.

How the Eye Sees

Having 20/20 vision means seeing at 20 feet what a person with normal vision sees at 20 feet. A person who has 20/40 vision can see at 20 feet what the person with normal vision sees at 40 feet. And so on.

The eye does not actually "see" objects. Instead, it sees the light that objects reflect. To see clearly, light striking the eye must be bent or "refracted" through the cornea—the clear window at the front of the eye that provides most of the focusing power. Light then travels through the lens, where it is fine-tuned to focus properly on the nerve layer that lines the back of the eye—the retina—and sent to the brain via the optic nerve. The retina acts like the film in a camera, and clear vision is achieved only if light from an object is precisely focused on it. If not, the image you see is blurred. This is called a refractive error.

Refractive errors usually occur in otherwise healthy eyes. They are caused mostly by an imperfectly shaped eyeball, cornea or lens. There are four basic types of errors:

Myopia or nearsightedness—Close objects appear sharp but those in the distance are blurred. The eyeball is longer than normal from front to back, so images focus in front of the retina instead of on it.

Hyperopia or farsightedness—Distant objects can be seen clearly but objects up close are blurred. The eyeball is shorter than normal, so images focus behind the retina.

Astigmatism—Objects are blurred at any distance. The cornea, lens, or both are shaped so that images aren't focused sharply on the retina.

Presbyopia or aging eye—The eye loses its ability to change focus due to the natural aging process. This usually occurs between ages 40 and 50.

Glasses, contact lenses, and laser eye surgery attempt to reduce refractive errors by making light rays focus properly on the retina.

Laser Eye Surgery—A Popular Alternative

Laser eye surgery is intended for people who want to minimize their dependency on glasses or contact lenses. Laser surgery can provide vision correction similar to what would be obtained with glasses or contact lenses. People under the impression that surgery can improve their vision beyond what they can see with glasses or contact lenses, however, likely will be disappointed.

By far, the largest increase in laser eye surgery interest recently has been in a procedure called "laser in situ keratomileusis," popularly known as LASIK. Advertising for this technique appears prominently on broadcast outlets, including the Internet and in newspapers and magazines. Fortunately, says Terrence P. O'Brien, M.D., a spokesman for the American Academy of Ophthalmology (AAO), most surgeons and medical centers are doing a good job of educating the public about the risks and benefits of LASIK. "But patients need to be very well-informed in advance," he says.

LASIK permanently changes the shape of the cornea, and is performed for varying degrees of nearsightedness, farsightedness, and astigmatism. A surgical knife, called a microkeratome, is used to cut a flap in the cornea, leaving a hinge at one end of the flap. The flap is then folded back to reveal the middle...
The real struggle, he says, is in training recovery, with minimal pain, and little or no post-operative discomfort. In fact, most people who undergo LASIK, like Beth Polazzo—one of O'Brien's patients—can see well enough to drive immediately after surgery, and usually have excellent vision within a week.

“I had good vision immediately,” says the 54-year-old Brooklyn, N.Y., resident, even though eventually one eye had to be retreated. “This is the best I’ve seen since I was seven years old.” The laser does its work on each eye in less than a minute, and patients are typically back to work or normal activities within three days.

While most people are pleased with the results of their surgery, O'Brien says that, as with any medical procedure, there are risks involved. Some include: over- or under-treatment; the inability to wear contact lenses; permanent loss of vision; reduction in the quality of vision including the development of glare, halos, and starbursts; difficulty with night-driving; and reduced vision in dim lighting conditions. The risks are doubled when both eyes are treated at the same time.

Also, LASIK is not reversible. That's why in Polazzo's case, O'Brien intentionally undercorrected her distance eye. “We were aiming for modified monovision,” he explains, which means that one eye would see close up while the other would be corrected to see distances. But Polazzo experienced some regression in her distance eye—that is, her distance vision began to worsen as she returned to nearsightedness—some weeks following surgery. However, because of the initial undercorrection, O'Brien was able to fix the problem.

A. Ralph Rosenthal, M.D., director of the Food and Drug Administration’s Division of Ophthalmic and Ear, Nose and Throat Devices in the Center for Devices and Radiological Health, says that no one knows the long-term effects of laser eye surgery. “We just can’t know that yet,” he says, so when people call looking for a guarantee in years for the success of the procedure, “I can’t give them one.”

Before undergoing LASIK, Rosenthal says people should carefully weigh the risks and benefits based on what’s important to them, and potential side effects, including the pros and cons of having one or both eyes done on the same day. It’s also important to avoid being influenced by friends who have had LASIK surgery or doctors who encourage patients to do so.

For more on LASIK, such as what to expect before, during and after surgery, and how to find the right doctor, visit the FDA’s special LASIK Web site at www.fda.gov/cdrh/lasik/.

A second laser procedure used today as an alternative to LASIK is photorefractive keratectomy, or PRK. Although O'Brien says that less than 5 percent of people undergo PRK, it is still the procedure of choice for certain eye conditions. This type of refractive surgery gently reshapes the cornea by removing microscopic amounts of tissue from the outer surface with a cool, computer-controlled ultraviolet beam of light. It does not, however, involve cutting. The procedure takes only a few minutes, and patients are typically back to daily routines in five to seven days.

Clinical studies indicate that about 5 percent of PRK recipients continued to need glasses for distance vision following the surgery, and up to 15 percent need glasses occasionally, such as when driving. In addition, many people experienced mild corneal haze following surgery, which is part of the normal healing process. The haze appeared to have little or no effect on final vision, and could only be seen by a doctor under a microscope. For about 5 percent of PRK patients, best-corrected vision without corneal haze was less than 20/20.

Eye Tips
While you can’t do anything about age or genetic makeup, you can eat a balanced diet, wear sunglasses that block ultraviolet light, and get regular eye exams to help maintain good vision. Regular eye exams are important because they can detect early signs of disease long before the disease leads to vision loss. Doctors recommend that everyone have an eye exam shortly after birth, and at least every few years until age 40. After that, the eyes should be routinely checked every 2 or 3 years.

—C.L.
Contact Lenses—More Choices

Whether you’re interested in wearing contact lenses for the first time, or are considering an upgrade for comfort and convenience, discussing the latest innovations with your eye-care practitioner will help make your choices easier and minimize the risks. Advances in materials for precision lenses have made soft and rigid gas permeable contacts—the two main contact lens groups—an option for more people. These medical devices are made of many different types of plastic, and offer numerous options. With daily wear or extended wear (overnight) lenses, the options include frequent- or planned-replacements, disposables, bifocals, UV-blocking contacts, and more. There are clear, tinted, opaque, spherical and rounded lenses. So where does someone start when deciding if contact lenses are the right choice for vision correction, and what to choose?

Hal Balyeat, M.D., professor of ophthalmology at the University of Oklahoma’s Dean A. McGee Eye Institute, says people satisfied with their vision correction may not need to look very far. “If you are already a satisfied contact wearer,” he says, “you may not consider other options worthwhile when you’re wearing your contacts as well as you are.” Satisfied wearers typically have no allergies and have not developed an intolerance to contact lenses. The bottom line: If contact lenses are working for you, Balyeat says, it’s hard to justify other options, such as permanent laser alteration of otherwise healthy eyes.

Balyeat cites his wife, Marilyn, as an example. Although she was a good candidate for the LASIK surgery, she opted for monovision contacts—one lens focuses close up while the other lens corrects for distance vision. “At 60,” she says, “I can still read without glasses.” And that, says her husband, is the single most important factor: “If you like being able to take out your contacts and still see up close, surgery is not a worthwhile trade-off.” Balyeat adds that many people don’t realize that laser surgery, performed on people over 40, won’t let you see up close without glasses or contacts unless you opt for monovision LASIK.

Contact lens quality continues to improve. Soft contacts contain from 25 percent to 79 percent water, are easy to adjust to, and are more comfortable than rigid gas permeable (RGP) lenses, thanks to their ability to conform to the eye and absorb water. Soft lenses aren’t likely to pop out or capture foreign material such as dust underneath, as hard lenses are. Extra-thin soft lenses are available for very sensitive eyes.

While the ability to hold water increases oxygen permeability of soft lenses, it also makes them more fragile. And soft lenses are more likely to absorb chemicals and residues on the wearer’s hands.

RGP lenses are more durable and resistant to deposit buildup, and they generally give clearer, crisper vision. They tend to be less expensive over the life of the lens, but the initial cost often is higher. RGP contacts last several years, while soft contacts, depending on the type, are meant to be replaced after periods ranging from a day to about a year. In addition, RGP lenses can be marked
Constance Dicembre waits for the countdown that prompts the laser application. A lid speculum is placed between her eyelids to prevent her from blinking.

Terrence O’Brien, M.D., (left) performs LASIK eye surgery at Johns Hopkins University’s Wilmer Eye Institute in Baltimore. O’Brien first surgically creates a flap of corneal tissue less than the thickness of a human hair and lifts it to one side. Assisted by associate Marc Winnick, M.D., O’Brien then applies laser energy to reshape the cornea according to carefully calculated measurements. The monitor on the wall shows the precise location of the laser beam on the cornea. Finally, the flap, which serves as a naturally adhering bandage, is repositioned.

Many changes are occurring in the world of disposable (defined by the FDA as used once and discarded) and frequent- or planned-replacement contacts. The latest innovations include daily disposables, bifocals and toric contacts for astigmatism.

“It’s healthier to replace lenses more often,” says James Saviola, O.D., chief of the vitreoretinal and extraocular devices branch in the FDA. “And if you reuse your lenses, you need to do something more than store them in saline solution.” The FDA approved in 2000 the first “no-rub” cleaning solution for contact lenses. The solution adds a safeguard for people who do not rub their lenses—but should—when cleaning. The no-rub directions for this first solution initially applied to lenses replaced within a month or less. Now, it has been expanded to include lenses that are replaced after a month or more. Other products also are available that have no-rub directions for lenses replaced within a month. But Saviola reminds people that in some cases, rubbing is still necessary to keep their lenses clean.

A new generation of lens materials is being studied. These lenses provide a greater amount of oxygen permeability than lenses currently on the market, says Saviola. One type already has received FDA approval for seven days of continuous wear. Others, such as the 30-day continuous wear contact, now are being considered.

The most serious safety concerns with any contact lens deal with overnight use, or extended-wear. Rigid or soft, wearing these types of contacts overnight is... (Continued on page 31)
Buying Contact Lenses by Phone, Mail or the Internet

If you buy contact lenses—an FDA-regulated product—on the Internet, over the phone, or by mail, the agency wants you to be well-informed. While such purchases are often a convenient and economical way to get your lenses, consumers need to exercise caution when using alternatives to a prescription from an eye-care specialist, or reputable pharmacy. The following information and tips can help:

Health-Related Information
- Get regular eye exams. You may have problems with your eyes that you are not aware of, and your contacts may not correct your vision properly. Some untreated infections can lead to blindness.
- Have an eye-care specialist check to make sure that your contact lenses fit properly and that the contact lens prescription was filled properly. Failure to do so could cause discomfort or damage to your eyes.
- Beware of attempts to substitute a different brand than what you normally wear. There are differences in water content and shape between brands. The choice of which lens is right for you should be made only based on examination by your eye-care specialist, not over the phone or the Internet.
- Request the manufacturer’s written patient information for your contact lenses. It will give you important information, as well as instructions for use.

Prescription-Related Information
- The minimum elements contained on a valid contact lens prescription should include your name, doctor’s name, contact lens brand name and material, expiration date (if mandated by your state), and lens measurements, including power, diameter and base curve.
- Make certain your contact lens prescription is current when ordering. The expiration date is currently set by each state. Some states require one- or two-year expiration dates, while other states leave it to eye care-specialists to decide. Never order lenses using a prescription that has expired.
- Be sure the lenses the company sends matches your prescription exactly. Check that you have the brand and lens name you ordered, and that the numbers indicating power, sphere, cylinder and axis (if any), diameter, and base curve are the same as on your prescription. This information is required to appear on the contact lens package or container.
- If you think you have received an incorrect lens, check with your doctor. Don’t accept substitutes for any contact lens unless your doctor approves.
- Some Internet sites ask for information about your doctor so that they can check the prescription. If they do check and receive a verbal OK, then they have complied with the Federal prescription device regulation. If the company does not check, they have not obtained a valid prescription. Some state laws require that a written prescription be presented.
- Order your contacts from a supplier you are familiar with and know is reliable.
- You won’t break any laws if you buy lenses on the Internet, by phone, or through the mail without a prescription, but you should know that the company is selling you a prescription device as if it were an over-the-counter device. This violates federal regulation. Be wary when companies tell you they will check with your doctor to confirm the prescription. They don’t always check.

Problems Relating to Purchases
- Report serious eye problems associated with your lenses to the FDA’s MedWatch reporting program at www.fda.gov/medwatch/. Also, contact your health professional for medical advice.
- Report problems involving contact lens sales by Web sites by sending an e-mail to webcomplaints@ora.fda.gov.
- If you do not get the exact lenses you ordered, you should report the problem directly to the company that supplied them.

—C.L.
(Continued from page 29)

duces the risk of corneal ulcers— infection-caused eruptions on the cornea that can lead to blindness. Symptoms in- clude vision changes, eye redness, eye discomfort, and excessive tearing. Ex- tended-wear rigid lenses also can cause unexpected, sometimes undesirable re- shaping of the cornea. Saviola advises that keeping lenses clean, replacing them often, and wearing them as pre- scribed by your eye-care specialist in- creases the safety of wearing contacts.

People should not wear contact lenses longer than the time prescribed by their eye-care practitioner. But whatever he or she prescribes, be sure to ask for written instructions and follow them carefully. Patient package inserts usually accompany instructions and follow them carefully. Saviola emphasizes that people who are not offered this infor- mation by their doctors should ask for it.

For those who haven’t been able to wear contacts, implantable lenses may be an option in the future.

Orthokeratology

Orthokeratology, or Ortho-K, is a pro- cedure that uses RGP contact lenses to change the curvature of the cornea to improve its ability to refract light and successfully focus on objects. Unlike regular RGPs, Ortho-K RGPs have a design that can reshape the curvature of the cornea. This method, however, does not produce a permanent result.

With conventional Ortho-K, the lenses are worn about eight hours a day. After the cornea has achieved the best shape for optimal vision, the lenses are worn less frequently—perhaps for a few hours every two or three days. If someone starts and then discontinues Ortho-K, says Saviola, the corneas will eventually return to their natural state. People choose Ortho-K over refractive surgery because Ortho-K’s effects are not per- manent.

One disadvantage of Ortho-K is that clear vision may fluctuate during the day. Also, Ortho-K may take many months to change a person’s vision. A more advanced technique known as “accelerated Ortho-K” takes less time, and may be recommended to achieve a rapid effect.

Since 1998, Saviola says the FDA has cleared a number of daily wear Ortho-K lenses, but overnight Ortho-K lenses have not been approved.

The best candidates for prescription Ortho-K are people of any age who have low amounts of nearsightedness or astigmatism. The goal is to bring the person’s vision to at least 20/40. But for some, Ortho-K will provide 20/20 vision.

Corneal Ring Segments

In 1999, the FDA approved a non-la- ser surgical procedure for correcting small amounts of nearsightedness. Cor- neal ring segments are tiny, clear cres- cent-shaped pieces of plastic polymer that are implanted in the cornea. The ring segments reshape the cornea so that it becomes flatter, allowing it to focus light rays onto the retina and producing sharp vision. The procedure takes about 15 minutes and is done on an outpatient basis. Before surgery, anesthetizing drops are placed in the eyes.

Corneal rings are still being studied to treat mild hyperopia and astigmatism, although these uses have not been ap- proved by the FDA. Several other in- tracorneal and corneal implants, from several companies, also are in various stages of clinical study.

Eyeglasses—The Old Standby

In some cases, modern technology can provide the best vision correction op- tion. In those cases in which it can’t, eyeglasses can often help. Glasses cor- rect refractive errors by adding or subtracting focusing power to the cornea and lens. The power needed to focus im- ages directly on the retina is measured in diopters. This measurement is also your eyeglass prescription.

Like contact lenses, glasses come in all shapes and sizes, offering an array of choices for both function and fashion. Eyeglass frames, for example, are more durable and tout materials such as tita- nium and new “memory metals.” Lenses are thinner, stronger and lighter. Lens options include antireflective coating, light-changing tints, progressive (line- free) bifocal lenses, and polycarbon- ate—the most impact-resistant lens ma- terial available.

Perhaps the greatest troubling aspect for eyeglass wearers is the constant feel of something sitting on the nose, despite such advances as featherweight glasses. Paul Trossevin of Falling Waters, W.Va., knows all too well the uncomfortable feeling of something permanently perched on his nose. Like a scar that never fades, Trossevin’s glasses have been with him every day since he was 4 years old. Now 35, he says, “There was a time when I’d have done anything to get rid of my glasses.” Or so he thought.

Although he could never wear contact lenses because of the severe flatness of his cornea, Trossevin was a candidate for laser eye surgery. But the one thing he was unable to obtain from any doctor was a guarantee that after surgery he wouldn’t see starbursts and halos around lights—a big concern since he drives a good part of the day and plays baseball at night. “The guarantee was every- thing,” he says. “When he couldn’t give me that, suddenly my glasses took on new meaning—a guarantee of the good eyesight they have given me for over 30 years.”

Looking Ahead

Among some of the more intriguing developments in the vision-correction pipeline is an alternative to LASIK, called LASEK, a new avenue for refrac- tive surgeons that disturbs less corneal tissue than its sound-alike counterpart. There’s also talk of investigational de- vices that could be placed inside the eye to correct refractive errors. Over the next decade, there are sure to be im- provements in current techniques and technologies, in addition to new proce- dures.
Every year the FDA’s internship programs bring hundreds of students out of the classroom and into the real-life setting of a regulatory agency.

By Linda Bren

In a field in a quiet suburban Maryland neighborhood, a cow grazes with her calf. Within the walls of a large concrete building, pigs eagerly devour their food, letting out occasional grunts. And in another building, silver-colored salmon swim in large tanks equipped with lighting timed to simulate daylight and darkness.

This bucolic setting just a few miles from the White House and the Baltimore–Washington, D.C., corridor is actually the busy hub of the Food and Drug Administration’s veterinary research program. Here, at the Center for Veterinary Medicine’s (CVM) Office of Research, scientists of all types—microbiologists, biochemists, toxicologists, pharmacologists, and geneticists—do the research necessary to support many of the FDA’s regulatory decisions. Their work helps ensure the safety of our food supply and the safety and effectiveness of animal drugs.

The Office of Research—a 160-acre complex of laboratories, offices, animal buildings, and pastures—is also one of the FDA’s many training grounds for student interns who are on their way toward becoming doctors and scientists.

Every year the FDA’s internship programs bring hundreds of students out of the classroom and into the real-life setting of a regulatory agency. Coming from colleges and universities across the United States and around the world, these future scientists and administrators get valuable hands-on experience working in every FDA center and office.
The internships, which last anywhere from several weeks to a year, are awarded to students pursuing careers in biology, microbiology, pharmacology, toxicology, epidemiology, human and veterinary medicine, regulatory science, and even communications and finance. These interns arrive with the latest theories and techniques, and leave with the first-hand experience and qualified judgment that will enrich them throughout their future careers.

Windows to Research

Brandon Dominguez knows all about farm animals. Growing up on a small farm outside of Dallas, he fed them, groomed them, and treated them when they were ill. He helped a pregnant sow deliver her piglets, and he kept watch over newborn foals late into the night. He also spent the last three years training in Texas A&M University's animal science program.

But what this 21-year-old student didn't learn on the farm or in school is how human and animal drugs are regulated and the science behind the regulatory decisions. For that, Dominguez traveled 1,500 miles from his home in Texas to work at the FDA as a student intern.

He could have worked at a local veterinary hospital, as he's done in previous summers. "But I wanted to get more experience with the government aspects of veterinary medicine," says Dominguez, "to see their research programs, and get a better understanding of the regulatory process."

Dominguez is one of about a dozen students who participate each year in "Windows to Research," CVM's summer intern program. These fledgling scientists work with FDA researchers on such projects as detecting antibiotic-resistant bacteria in animals and determining the levels of drugs transmitted from nursing mothers to infants.

"The intent of the program is to encourage students, especially minorities, to go into the field of science," says Woodrow M. Knight, Ph.D., scientific adviser for CVM's Windows to Research program and director of the division of biometrics and production drugs. "We want them to leave with a good feeling about the FDA to pass back to their community," says Knight, "and we encourage students to think about future employment with CVM."

Safe Drugs for Mother and Child

Working alongside FDA pharmacologists and animal scientists, Dominguez learns about the transfer of drugs from a nursing mother to her infant. The "cow-calf model," a project supported by the FDA's Office of Women's Health, helps Dominguez understand the importance of drug accumulation and elimination rates in determining safety.

Why is it a "cow-calf" and not a "mother-child" study? Because data on how drugs taken by a human mother might affect her breast-fed infant are very limited, says Alberto Chiesa, D.V.M., Ph.D., visiting scientist and lead researcher on the cow-calf project. There are difficulties inherent in frequently drawing blood samples from infants and taking test samples of the mother's milk. An animal model, such as this one, enables this research to be performed.

Although using a cow to simulate a human mother may not be the most flattering comparison, there are similarities between the two, says Pamela Chamberlain, D.V.M., Ph.D., lead developer of the cow-calf model. Both are pregnant for nine months, and both can produce milk for about the same length of time. In addition, both human mothers and cows secrete colostrum (a substance high in protein and antibodies), which gradually changes to milk over the course of a few days after giving birth.

To determine the levels of a drug transfer, Working alongside FDA pharmacologists and animal scientists, Dominguez learns about the transfer of drugs from a nursing mother to her infant. The “cow-calf model,” a project supported by the FDA’s Office of Women’s Health, helps Dominguez understand the importance of drug accumulation and elimination rates in determining safety.

Fish tuberculosis vaccine research may uncover important information useful for developing a human tuberculosis vaccine.

Fish tuberculosis vaccine research may uncover important information useful for developing a human tuberculosis vaccine. Dozens of tanks hold rainbow trout, channel catfish, largemouth bass, tilapia and other fish used in the FDA’s aquaculture research. Some of the research, such as studying the use of drugs against fish pathogens, requires strict isolation procedures.
One of the FDA’s most important, and challenging, tasks is protecting the public from antibiotic-resistant bacteria.

Benefits of the FDA’s Intern Programs

The FDA offers internships to undergraduate, graduate, and professional students (for example, those completing Ph.D. program requirements). The programs are available to U.S. and some international students, including minorities and students with disabilities.

The FDA internship programs help students develop valuable skills and work experience that enrich their education and make them more employable upon graduation. Students can realistically test their career objectives, heighten their awareness of careers at the FDA, build a work history for their résumés, and earn money.

In turn, the FDA gets a qualified source of temporary help on projects, a means to evaluate potential job candidates, and an opportunity to hear new ideas and support the growth of scientific talent.

“It’s a win-win situation for the student, FDA, and society,” says Judy Blumenthal, Ph.D., an FDA personnel staffing specialist.

For more information on the Center for Veterinary Medicine’s intern program, contact Bessie Cook, manager of CVM’s Equal Employment Opportunity office, at 301-827-4587.

For information on the many other intern programs throughout the FDA, contact personnel staffing specialists Judy Blumenthal at 301-827-4079 or Marge Dexter at 301-827-4080.

Fighting Antibiotic Resistance

Another area being studied by CVM’s interns focuses on one of the FDA’s most important, and challenging, tasks—protecting the public from antibiotic-resistant bacteria.

The use of some antimicrobials (substances to kill or weaken bacteria, viruses, fungi, or parasites) in livestock and poultry has been shown to cause the development of antibiotic-resistant bacteria, such as Campylobacter, in these animals. People who then consume the animals are at risk of becoming infected with bacteria that current antibiotics can’t easily kill.

Antibiotic-resistant bacteria can pose a serious health problem. Antibiotics that were once effective have become less effective against certain common types of bacteria due in part to overuse. As a result, strains of bacteria resistant to all but the strongest antibiotics are being seen more often by physicians and public health laboratories.

Campylobacter, for example, is the most common bacterial cause of diarrheal illness in the United States, according to the Centers for Disease Control and Prevention. Most of the more than 2 million Americans (1 percent of the population) estimated to be infected with

Fish raised for food swim in water treated with chemicals and drugs to prevent disease. FDA scientists are using these Atlantic salmon to develop methods for detecting chemical residues in fish tissues to help make sure fish are safe to eat.
Campylobacter each year will recover without any specific treatment. But severe cases are treated with an antibiotic—and sometimes the drug doesn’t work because the bacterial strain has become resistant. Campylobacter can be life-threatening in people with weakened immune systems.

In addition to their ability to develop resistance to antibiotics, bacteria are capable of becoming resistant to formaldehyde, organic acids, and other antimicrobials. Some of these antimicrobials are used in human and animal foods to fight Salmonella, molds, or other microorganisms that cause disease or spoilage. Recent research indicates that certain kinds of bacteria fight the effects of formaldehyde and other antimicrobials in some of the same ways they fight the effects of antibiotics.

CVM scientists are conducting research to determine whether or not the use of formaldehyde, organic acids, and other antimicrobials in animal feeds can trigger the development of antibiotic-resistant bacteria.

Student intern Allissa Hosten, a senior in the pre-med program at Xavier University in New Orleans, has spent the last three summers with CVM research. Last summer, she worked with CVM research scientists on tests to detect MBM in processed cow feed. Current tests that detect MBM also detect milk and blood—they cannot distinguish the prohibited MBM from the allowable milk and blood. (Feed containing milk and blood is allowed because these products have shown no evidence of posing the risk of transmitting BSE.)

Yancy is designing a test to detect bovine MBM and to distinguish it from milk and blood. Other CVM scientists are working on tests to detect MBM from other animal species. These tests will allow CVM to check samples of cow feed from processing facilities to ensure that the feed does not contain the prohibited MBM.

Yancy says, “It’s a very exciting project,” and has—crossed over into people who eat BSE-contaminated beef. BSE has been linked to about 100 human deaths in Europe from a rare brain malady called new variant Creutzfeldt-Jakob disease, or vCJD.

By preventing cows from getting BSE, the untreated and fatal vCJD may also be prevented.

Aquaculture Research

Americans have nearly doubled their consumption of farm-raised fish over the past 35 years, says Renate Reim-schuessel, V.M.D., Ph.D., director of CVM’s aquatic research program.

Aquaculture, the farming of water creatures such as fish, mollusks, and crustaceans, as well as aquatic plants, is becoming an increasingly important source of protein-rich food for human consumption. As the number of aquaculture facilities grows, so does the need to assure that farmed fish are safe and effective and must not harm plants, microorganisms or other sea creatures not targeted by the drugs. CVM is doing aquaculture research to meet these needs.

One of these research areas is the study of fish tuberculosis (TB). A disease caused by the bacterium Mycobacteria marinum, fish TB attacks the internal organs and can kill fish within a matter of weeks. CVM is examining mutants of the fish TB bacteria to learn more about how they infect fish and to develop vaccines to prevent the spread of this fish disease.

The TB that infects people, once the leading cause of death in the United States, began to decline in the 1940s with the introduction of effective antibiotic drugs to treat it. But the CDC now reports the number of cases to be rising, and TB has re-emerged as a serious public health problem. Since fish TB is very similar to human TB, fish vaccine research may uncover important information useful for developing a human TB vaccine.

Reimschuessel describes aquaculture medicine as a “specialty in its infancy,” and CVM welcomes veterinary interns interested in this vital area of fish farming and aquatic animal research.

Clerkship Program

The summer intern program is only one of the FDA’s mechanisms for train-
ing future scientists. Another is the “clerkship” program, which allows graduate students to spend part of the school year experiencing the FDA’s regulatory process first-hand.

Like the summer intern programs, clerkship programs are offered throughout the FDA, allowing students to work in the areas most relevant to their fields of study.

CVM has a three-week clerkship program for students in their senior year of veterinary medical school. Open to veterinary schools nationwide, the program recruits students through the Center for Government and Corporate Veterinary Medicine (CGCVM), a program of the Virginia-Maryland Regional College of Veterinary Medicine (VMRCVM).

Schools rely on clerkship programs to provide students with a broad understanding of all aspects of a student’s field of study. “Veterinary schools, like all professional schools, are constantly inundated with new information,” says Peter Loizeaux, D.V.M., deputy director of the CGCVM, “and not all aspects of the profession can be taught in an academic setting.”

The FDA is one of over 100 government and corporate organizations that work with the VMRCVM to help train veterinary students and allow them to see alternatives to private veterinary practice. “It really opens their eyes to career opportunities they may not have considered,” says Loizeaux. About 70 percent of veterinarians are in private practice; 30 percent are in the government and corporate arena and that number is steadily increasing.

In CVM’s clerkship program, managers involve the students in discussions and decision-making, says Steven Vaughn, D.V.M., a scientific adviser for the program and director of the division of therapeutic drugs for food animals. “It gives them a sense of some of the issues facing CVM and how we go about trying to deal with those issues. It also gives them a flavor of the political environment working in Washington.”

FDA scientists reap benefits, too. They get the latest information and concepts coming out of colleges. “Students have new information on current research, theories being bandied about, and leads on experts and who is working on what,” says Vaughn.

Each student is assigned a project to complete in the three-week period. Although three weeks may seem a short time to make a significant contribution, a student’s project can make a difference to the agency, says Vaughn.

One student researched three different syndromes of flexibacteriosis, a disease in fish that are raised as food. “Her work enabled us to define study protocols to demonstrate that a drug was effective against the disease and to tell the sponsor how to proceed with their drug development efforts,” says Vaughn.

That former student, Joan Gotthardt, D.V.M., now leads the CVM’s aquaculture drugs team.

Gotthardt had left her 11-year federal government career and a scientific position where she supervised 37 people to attend veterinary school. “When I went off to vet school, I thought I wanted to go into private practice,” says Gotthardt. But as she was finishing school, she pursued a job opportunity at the FDA. “I have not looked back,” she says. “I think what we do here is extremely important and worthwhile.”

Terri Dudis, D.V.M., of Elkwood, Va., is one former CVM clerkship student who did go into private practice. Dudis, formerly a “content and complacent middle-level manager” at the U.S. Department of Transportation, traded in her 20 years of government service for a career in veterinary medicine. Leaving her job and her 100-acre horse farm, she moved to Blacksburg, Va., to attend VMRCVM.

Today, Dudis and her business partner travel through the countryside of Virginia in their 26-foot mobile veterinary clinic, equipped with a surgical suite, laboratory, x-ray machine, and darkroom. “There were some bumps in the road in setting up a new business,” says Dudis, “and I’m working really hard, but it’s a wonderful path I chose.”

Whether their sights are set on private practice or a government or corporate job, students can profit from CVM’s clerkship program, says Vaughn. “Whichever path they choose, working with CVM helps them understand that even though we’re a small organization, the impact of our decisions is nationwide and has great importance.”

Terri Dudis, D.V.M., examines a dog’s ear for infection while Lori Blankenship, D.V.M., restrains the patient. Dudis, a former intern at the FDA’s Center for Veterinary Medicine, is now a veterinarian in private practice.
Hot spots and cool links on FDA's Web site and beyond.

By John Henkel

Healthy Topics: Easy Does It

Here's a great way to learn more about a variety of health subjects: Check out the FDA's collection of 21 easy-to-read brochures. Originally issued in printed form, the publications are available in English and Spanish. You can choose text-only versions or PDF format, which retains the graphics and layout of the printed versions.

Among the topics covered:
- Keeping food safe
- Protecting your child from poisons
- Arthritis treatments
- Losing weight safely
- Mammograms and breast cancer
- Bladder problems
- Safe sunning

These brochures are loaded with helpful hints. For example, "Eating for a Healthy Heart" includes a chart that suggests healthier options as substitutes for high-fat products such as butter and whole milk, or for high-sodium foods such as smoked meats. Another brochure, on choosing medical treatments, gives tips on how to spot fake or fraudulent therapies.

You can find these easy reads at www.fda.gov/opacom/lowlit/7lowlit.html.

Taking Off Some of the Pressure

Having high blood pressure increases the risk of stroke, heart disease and kidney disease. It has no warning signs, usually lasts a lifetime, and can affect any race, age or gender. Though about 1 in 4 Americans has this disorder, it can be prevented and controlled with some basic steps. How? A Web site called "Your Guide to Lowering High Blood Pressure" explains. Maintained by the National Heart, Lung, and Blood Institute, the site, at www.nhlbi.nih.gov/html/detect/detect.htm, describes the basics of blood pressure, such as the meaning of the two numbers—systolic and diastolic pressure—that are recorded when blood pressure is measured. The site also has helpful information on what causes high blood pressure, its effect on the body, and the proper devices to use for measuring your own blood pressure.

A Cool Site for Kids (or Kids at Heart)

You don't have to be a kid to appreciate all the neat stuff on the new "FirstGov for Kids" Web site, but kids will have an especially good time checking out all the site's goodies at www.kids.gov. Sure, there are plenty of cool destinations such as "music," "plants and animals," "science," and "recreation." But what if you need some help with that school paper? Click on the "homework" page. Want to know more about fighting crime, how your government works, how to spend money wisely, or how to stay safe at all times? The info is a click away. In the site's health section, you'll find the FDA's Kid's Page, along with a dozen other sites that carry information including how drugs affect your body, how to preserve your hearing, and the real facts about cigarette smoking. And if you're in the mood for something less serious, there's even a page called "fun stuff," where you can play games such as matching mascots with their teams.

FirstGov for Kids is hosted by the Federal Consumer Information Center and is one of the latest "cross-agency portals" sponsored by FirstGov (www.firstgov.gov), a site that gives users easy access to information from federal and state agencies.

Lots of Info, A Page at a Time

Fighting rare disorders. Preventing "mad cow disease" in the United States. Keeping the country's food supply safe. Improving American public health. These are a few of the subjects found in a series of 12 short information sheets about FDA's work available now on the agency's Web site.

These "one-pagers" give a quick overview of many of the important health issues facing FDA and how the agency deals with them. For example, "FDA's Sentinel of Public Health..." gives a glimpse into how FDA regulates the 115,000 business establishments that produce, store, import and transport $1 trillion worth of consumer goods. Another sheet reveals the challenges in regulating gene therapy, vaccines, and other emerging biomedical technologies.

For a peek at FDA and its workings, go to www.fda.gov/opacom/factsheets/justthefacts/.

John Henkel is a member of the FDA's website management staff.
Nurse Sentenced For Drug Tampering
At Indiana Hospital

By Michelle Meadows

A former registered nurse used syringes to steal morphine and another powerful narcotic and then tried to cover up his crime by refilling vials with saline solution, Food and Drug Administration investigators say.

Paul Seymour, 30, was sentenced to five years and three months in prison on May 11, 2001, after pleading guilty for drug tampering, with reckless disregard for patients' pain.

The FDA's Office of Criminal Investigations in Chicago and the Drug Enforcement Administration (DEA) in Indianapolis partnered on the case.

The investigation began after an employee at Westview Hospital in Indianapolis reported in September 2000 that vials of Demerol (meperidine) and morphine had been tampered with.

Demerol and morphine are Schedule II drugs used to treat pain. These controlled substances have a high potential for abuse, and abuse of the drugs may lead to severe psychological or physical dependence. (The classes—or schedule—of drugs are explained in "Controlled Substances" on page 23.)

Investigators identified Seymour, a nurse at Westview, as a suspect on Sept. 10, 2000. Hospital employees reported that he recently had several unscheduled absences, and exhibited other erratic behavior such as sweating excessively and appearing drowsy to the point of nodding off. In addition, a criminal history check revealed that Seymour was on probation in Marion County, Southern District of Indiana, for possession of crack cocaine.

One of the terms of Seymour's probation was that he allow authorities to search his residence at any time. On Sept. 15, 2000, the Marion County Probation Department, FDA and DEA agents, and the Indianapolis Police Department searched Seymour's apartment and seized numerous needles and syringes connecting him with the tampering. Investigators discovered residue of Demerol and morphine on several syringes, substituted saline solution for the drugs to cover up his tampering. Then he put the drugs back on the shelves. Analysis by the FDA's forensic chemistry center in Cincinnati confirmed that some of the drugs had been replaced with saline.

Seymour claimed to have committed the tampering for two months. Investigators determined that 87 vials of Demerol and morphine had been tampered with, and approximately 14 boxes showed indications that the drugs had been diluted or substituted with saline. Boxes containing the vials had puncture marks on the bottom. In some cases, Seymour was able to draw drugs from the vials without opening the boxes. Other times, he opened packages and resealed them.

The drugs that had been tampered with were available for use by hospital patients, but it isn't clear how many patients were affected and to what extent, according to an FDA special agent. Seymour was arrested on a federal warrant for violating Title 18, United States Code, Section 1365—tampering with a consumer product—on Nov. 14, 2000.

Seymour is serving his prison sentence, which includes drug treatment, in a federal facility in Lexington, Ky. In addition, Seymour must pay a $1,000 fine and will remain on probation for three years after release from prison. His nursing license has been suspended indefinitely, and he cannot be employed in the health-care field again without court approval.
Educate Before You Medicate: Your Lifeline For Safe Medicine Use

By Ray Bullman

Any medicine, whether prescription or nonprescription, can be dangerous if used incorrectly. Yet the healing power of modern medicines leads physicians to write a prescription in over two-thirds of all U.S. doctor visits—more than any other type of intervention.

Undoubtedly, you are among the large majority of medicine-users who take medicines correctly. Or are you?

- Have you ever forgotten to take a dose, so you took a double-dose at the next scheduled time? Or earlier?
- Have you stopped taking a medicine before your prescription ran out because you started feeling better, although you’d been counseled to finish the entire bottle?
- Have you mixed medications and alcohol without a clear understanding of whether it is safe to do so?
- Have you started taking a new prescription, nonprescription medicine, or dietary supplement without reading all the accompanying information about safe and proper use?

If you answered “yes” to any of these situations, then you are in the majority of all medicine-users. But answering “yes” in these cases does not mean you have crossed the line into prescription drug abuse. Rather, it proves just how common misuse is, and how difficult it can be to use medicines appropriately.

For nearly 20 years, the National Council on Patient Information and Education (NCPIE) in Bethesda, Md., has worked to improve communication between consumers and their health-care professionals to promote safe and appropriate medication use. In the mid-1980s, recognizing the enormous health and economic consequences of medication misuse, NCPIE dubbed this pervasive public health issue “America’s Other Drug Problem.”

Here are three steps you can take to help ensure safe medicine use:

Step 1: Take part in your treatment decisions.
Don’t be afraid to ask questions and talk about your concerns. This means telling your health-care provider about any illnesses or problems for which another health professional is treating you; discussing the risks and benefits of each medicine or treatment you might get; telling your doctor about any medicine allergies; and revealing if you’ve experienced medication or alcohol dependence or abuse in the past.

Step 2: Follow your treatment plan.
This includes contacting the doctor with any concerns you have about your medicine, especially during the first few days as the body is adapting to the medication. Don’t let embarrassment keep you from telling your doctor important information.

Step 3: Watch for problems and get help in solving them.
Keep working with your health professionals while you are taking your medicine. This means don’t change doses or abruptly stop a prescription without consulting a health-care provider first. Ask about results of medical tests that indicate if the medicine working and if medicine is still needed. Tell your health-care provider about any side effects or any new problems that may be related to the medicine.

To put it simply, NCPIE suggests you Educate Before You Medicate.

Anytime a medicine is prescribed, be sure to ask your health-care provider or pharmacist:
1. What is the name of the medicine and what is it for? Is this the brand name or the generic name?
2. Is a generic version of this medicine available?
3. How and when do I take it—and for how long?
4. What foods, drinks, other medicines, dietary supplements, or activities should I avoid while taking this medicine?
5. When should I expect the medicine to begin to work, and how will I know if it is working? Are there any tests required with this medicine (for example, liver or kidney function)?
6. Are there any side effects, what are they, and what do I do if they occur?
7. Will this medicine work safely with the other prescription and nonprescription medicines I am taking (including dietary or herbal supplements)?
8. Can I get a refill? When?
9. How should I store this medicine?
10. Is there any written information available about the medicine? (Is it available in large print or a language other than English?)

And remember, tell your health-care professionals:
- All of your medical conditions and the names of doctors providing treatment;
- The names of all medicines you are taking, including prescription and nonprescription medicines, dietary or herbal supplements, vitamins or minerals, laxatives, pain relievers and sleeping aids;
- any problems you are having with your medicines; and
- the medicines to which you are allergic.

Ray Bullman is executive vice president of the National Council on Patient Information and Education, Bethesda, Md. (www.talkaboutrx.org).
Over-the-counter (OTC) drugs, also called nonprescription drugs, are medicines that the FDA has decided are safe and effective for use without a doctor’s prescription. Today's OTC medicines offer consumers a greater opportunity to play a more active role in treating aches, pains and minor illnesses that may not require a trip to the doctor's office. It’s important for young and old alike to be well-informed and to understand the information contained on OTC labels. The FDA and the Nonprescription Drug Manufacturers Association have prepared a brochure to help consumers become better informed about OTC drugs and self-care.

To obtain a single copy of “Over-the-Counter Medicines: What's Right for You?”
write to:
Federal Consumer Information Center
Item 646-H
Pueblo, CO 81009

For free bulk quantities, write to:
Nonprescription Drug Manufacturers Association
Publications Department
1150 Connecticut Avenue N.W.
Washington, D.C., 20036

To view the brochure on the Web, visit:
www.fda.gov/opacom/what'sright/