Good Medicine
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Human Organs-on-Chips

INSIDE:
Hard to Swallow
How Meat Advocates Skewer Science
As you page through Good Medicine, you will see articles on good health, good science, and good ethics, reflecting the Physicians Committee’s work in all these areas.

But how do these seemingly disparate areas fit together? People who are concerned about ethical issues in research and are especially focused on alternatives to animal use may wonder why they should care about nutrition. Well, for starters, of all the cruel instruments used on animals, easily the worst are the knife and fork. Americans now eat more than 1 million animals every hour. Second, the health problems caused by animal-based diets—heart disease, diabetes, hypertension, cancer, and many others—have provided the rationale for a nearly endless burden of experimentation using millions of animals every year.

Those who are interested in nutrition and health may wonder why they should care about efforts to refocus medical research away from animals and toward human health. Well, not only are animal experiments cruel; they create a massive misdirection of focus. Take diabetes, for example. One might hope that research would focus on the rapidly changing food habits that have caused this epidemic and are fueling it throughout much of the world. Scientists might identify powerful new ways to change eating habits and put them to the test. They could work with local governments to test new nutrition policies and could work with businesses and schools to test new nutrition programs. They could work with physicians and hospitals to create novel ways to break the dietary habits that are at the core of diabetes.

However, at the National Institutes of Health, approximately a half a billion dollars are spent annually on “basic science” experiments on animals in hopes of creating a new drug target. The idea is to create pharmaceutical products that can be sold to people with diabetes in lieu of tackling the nutrition issues that could improve or even eliminate the disease.

As long as diabetes research is focused on creating an ever-better diabetic mouse or a new rat “model” that can be used to come up with yet another medication, we are neglecting the key issues, those which relate to diet and lifestyle.

A reorientation of efforts, focusing on prevention on the one hand and research on the other, is exactly what we need to create a better world.
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RESEARCH ETHICS  By Kristie Sullivan, M.P.H.

RESEARCH ALTERNATIVES

Highlights from the 9th World Congress on Alternatives and Animals in the Life Sciences

This year’s 9th World Congress demonstrated the progress being made throughout the world in replacing animal tests with better methods. Kristie Sullivan, M.P.H., the Physicians Committee’s director of regulatory testing issues, attended the congress and highlights some of the advancements on this page.

Advances in In Vitro Models of Liver, Lung

Two sessions showcased advances in modeling the human liver and lung. Test developers InSphero and Promethera presented small “spheroids” of liver cells, which are useful for assessing drugs and chemicals. Professor Taku Matsushita from Sojo University in Japan presented his work creating 3-D cultures of human liver cells that can live in a cell culture for up to six months. This time-frame allows scientists to understand a drug’s affect after daily repeated dosing. Currently, many animals are used to assess new drugs, despite proven failures.

Several other investigators reported progress using human tissue to study lung diseases. At the Fraunhofer Institute in Germany, lung tissue donated from surgical patients is sliced very thin to study asthma, COPD, and lung injury. Other companies in the United States and Switzerland are using cells to grow 3-D lungs. MatTek created a model that mimics asthmatic lung tissue to study the effects of viruses. Epithelix uses a similar model to test therapies to combat viral infection and inflammation, such as exposure to pollutants.

China, Other Governments Working to Accept Nonanimal Test Methods

Anne Gourmelon, of the Organisation for Co-operation and Economic Development (OECD)—which sets chemical testing guidelines worldwide—reported that in 2007, just six out of 47 projects at OECD were related to in vitro methods. This year, 27 out of 56 are related to in vitro methods or other approaches that reduce animal use.

In the same session, professor Shujun Cheng of China’s General Administration of Quality Supervision, Inspection and Quarantine presented several of his country’s initiatives to adopt nonanimal methods. EpiSkin, an in vitro method used for assessing skin irritation, is now being produced in China and is available for toxicity tests. Professor Cheng is collaborating with American and other testing laboratories to provide training to scientists and stated that scientists in China are eager to learn about how to use in vitro methods.

In the United States, the Food and Drug Administration is working to accept in vitro methods. The aim is to work together with pharmaceutical companies to accept new nonanimal tools for drug testing. This process will be much faster than traditional approaches, which can take up to a decade.
**LONGEVITY**

*Fruits and Veggies Reduce Death Risk*

Fruits and vegetables reduced the risk of dying over an observation period ranging from 4.6 to 26 years, according to a new meta-analysis published in the *British Medical Journal*. Researchers analyzed 16 separate studies, including one with 833,234 participants, and found that each serving of fruits and vegetables decreased the risk of dying by 6 and 5 percent, respectively.


**HEART HEALTH**

*Plant-Based Diet Reverses Heart Disease*

A new research report confirms that heart disease can be dramatically improved—and even reversed—by a plant-based diet. Caldwell Esselstyn Jr., M.D., and his team counseled 198 patients with cardiovascular disease on a diet free of fish, meat, dairy, and added oils. Of the 89 percent of participants who followed the diet, 81 percent improved their symptoms and experienced fewer complications from heart disease.

In addition, those participants lost an average of 19 pounds, while 22 percent saw a complete reversal of their condition. This study employed a nutritional training program that eliminated both added oils and animal products.


**CANCER**

*High Cholesterol Increases Breast Cancer Risk*

High cholesterol levels increase the risk for breast cancer, according to a study presented at the Frontiers in Cardiovascular Biology Meeting in Barcelona, Spain.

Researchers observed 664,159 women in the U.K. from the Algorithm for Comorbidities, Associations, Length of Stay and Mortality (ACALM) study. Risk of developing breast cancer was 64 percent higher in women with high cholesterol.


**DIABETES**

*A Vegan Diet May Reduce Diabetic Nerve Pain*

A low-fat vegan diet may reduce pain associated with diabetic neuropathy, according to a presentation by Physicians Committee researchers at the American Association of Diabetes Educators Annual Meeting in Orlando, Fla. In a randomized, controlled trial of 35 type 2 diabetes patients with painful neuropathy, half followed a vegan diet and took a vitamin B12 supplement for 20 weeks, while the other half only took the supplement. The diet group showed greater improvements in some pain measures and body weight compared with the control group. This study demonstrates the promise of a dietary approach to diabetic nerve pain and other microvascular complications.

When the Ebola virus emerged in Guinea in March 2014, it sparked global concern: There was no approved treatment, and the virus killed thousands. Potential treatments were mired in a slow and expensive animal testing phase and had not made it to definitive human clinical trials. Because of the severity of emergency, the World Health Organization approved the use of two experimental drugs without knowing their risks. The effectiveness of these treatments and their potential risks are still not clear. The outbreak highlighted a major problem: Not only do animal tests raise serious ethical issues and often produce results that do not apply to people (90 percent of animal-tested drugs fail in humans)—they are just too slow, and better testing methods are desperately needed.

The answer may come from a new method called “organ-on-a-chip.”

Imagine a small plastic chip about the size of computer memory stick. It is transparent with three lengthwise channels. The center channel is divided by a porous membrane. In one model, one side of the membrane is coated with lung cells, which air flows over. The other side is lined with capillary cells, which blood-like liquid flows through, mimicking the air sacs of the lung. The channels on either side of the center channel contract and expand rhythmically, like our lung cells when we breathe.

Scientists have used these chips to show how a cancer drug can cause the side effect pulmonary edema—fluid from the blood stream leaks into the air sac. They have also demonstrated the effects of airborne toxic nanoparticles on the lung. And similar chips could be used to test treatments for Ebola and other infections.

“The chips are essentially human organs that can be tailored for specific tests,” says Kristie Sullivan, M.P.H., Physicians Committee’s director of regulatory testing issues. “It’s a huge leap in technology that will help scientists escape the failures of animal testing and successfully conduct lifesaving research.”

The Wyss Institute at Harvard has already developed more than 10 organs-on-chips—including liver, gut, kidney, and bone marrow—that will one day interact with each other. The Food and Drug Administration, along with NIH and the Defense Advanced Research Projects Agency, is helping to fund Wyss’ research, aiming to develop a human-on-a-chip.

Funding is also going to about a dozen other universities developing chips or chip systems, including the brain, circulatory system, and female reproductive system.

At Wake Forest Baptist Medical Center’s Institute for Regenerative Medicine, researchers are working on...
Adverse Outcome Pathways Lead to Chemical Safety

It can take toxicologists three years to assess the safety of one chemical. That’s because animal tests slow down the process—and ultimately fail to predict human health effects. It’s causing a dangerous backlog in chemical testing. But Adverse Outcome Pathways (AOPs) can greatly reduce this burden and better determine how a chemical will impact human health.

AOPs use existing data on how a chemical or toxin affects biological systems and organizes it into a pathway to predict whether the chemical or similar chemicals will cause further damage. This can eliminate the need for animal testing.

For example, an inhaled chemical that binds to proteins in the airway or lung may cause an allergic reaction in humans. Instead of using an animal to test for an allergic reaction, the scientific case can be made that chemicals that bind to proteins in vitro (in a test tube), or cause certain reactions in cells in systems such as a lung-on-a-chip, will likely cause an allergic reaction.

The AOP process begins with questions about a chemical and how it affects a human at the most basic level. It then proceeds to question if and how that chemical affects a person at increasingly complex levels and eventually considers how the chemical could affect the entire population.

The more questions scientists already know the answers to, the less likely a test will need to be conducted:

1. What are the chemical’s properties?
2. How is a person exposed to the chemical? Is it inhaled? Does it come in contact with the skin?
3. After exposure, what immediately happens at the molecular level?
4. Does that event cause a response at the cellular level, such as activating a gene that causes cancer?
5. Does that cause a response in the organs, such as affecting the function of the lungs?
6. Will that cause a biological response, such as asthma or a tumor?

In 2012, the Organisation for Economic Co-operation and Development (OECD), an international body that coordinates international testing guidelines, launched a program to develop and record AOPs. Working out these chemical-response pathways and applying them to questions about human health and disease is the first step to a total revolution in testing and research.

Last year, at the Physicians Committee’s Inhalation Toxicity: Pathways to Better Methods conference, attendees recommended submission of an AOP that would pave the way for regulatory acceptance of nonanimal inhalation testing methods. Since that time Kristie Sullivan, M.P.H., director of regulatory testing issues, has led a team of international experts to develop the AOP, and this work was presented in two separate presentations at the 9th World Congress on Alternatives and Animal Use in the Life Sciences in Prague (see page 8).

Physicians Committee scientists have held the secretariat position of the International Council on Animal Protection in OECD Programmes since 2006. Through ICAPO, the Physicians Committee is working together with the OECD and other groups to develop and promote the OECD’s AOP program to other scientists throughout the globe.

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**Adverse Outcome Pathway**

- **Chemical**
- **Molecules**
- **Cells**
- **Organ**
- **Organism**
- **Population**
developing a body-on-a-chip that will accelerate the development of new therapies to respond to biological outbreaks such as Ebola and chemical attacks from agents such as sarin and ricin.

**Overhauling Toxicity Testing**

Drug development is just one application for these revolutionary chips made from human cells. The American Society for Cellular and Computational Toxicology (ASCCT)—which Physicians Committee scientists co-founded—recently held a conference at the National Institutes of Health. Donald E. Ingber, M.D., Ph.D., director of the Wyss Institute at Harvard, gave the keynote address, showing how the new technique could replace animal tests. Leaders from the Dow Chemical Company, the Environmental Protection Agency, and other stakeholders learned how organs-on-chips could revolutionize their work.

“Everyone we talk to wants to learn more about how organs-on-chips can help them replace animal tests—whether they are testing cancer drugs or chemicals,” says Sullivan.

The chips can also be used for consumer product testing. The Physicians Committee recently requested that the cosmetics company Elizabeth Arden use cellular methods, such as organs-on-chips, to avoid the problems inherent in animal testing.

“When researchers took a retrospective look at 150 human clinical trials of inflammatory diseases (including asthma, commonly triggered by fragrances) they found 100 percent of drugs developed using mice failed,” said the Physicians Committee’s Elizabeth Arden shareholder resolution.

“This striking example makes it clear that we need to fundamentally overhaul how we think about and conduct toxicology testing to make it more human predictive,” says Sullivan.

“The world is a safer place every time our recommendations result in the OECD replacing an animal test with a human-based method,” says Sullivan. The Organisation for Economic Cooperation and Development (OECD) is an intergovernmental organization that sets chemical testing guidelines worldwide.

In part because of ICAPO’s work, nine out of the last 11 test guidelines published by the OECD call for nonanimal tests. Under the Physicians Committee’s leadership, ICAPO is also committed to ensuring that the OECD continues leading the international coordination and development of Adverse Outcome Pathways (AOPs).

AOPs are frameworks that organize known information about chemicals’ effects on biological systems. This information can facilitate the development of in vitro methods and support their acceptance by regulatory authorities.

Sullivan also detailed plans for an AOP that would reduce or eliminate animal use for respiratory sensitization, a serious occupational health problem.

Other Physicians Committee presentations covered new initiatives to speed the development and use of human- and computer-based alternatives to animal tests.
SUNY Upstate Medical University in New York has ended the use of live animals in its emergency medicine residency program and will exclusively use human-relevant methods. This decision comes after the Physicians Committee encouraged the university to join the nationwide trend away from animal use for medical training.

“With this decision, SUNY Upstate joins the vast majority of programs that use superior nonanimal education methods,” says John Pippin, M.D., F.A.C.C., Physicians Committee’s director of academic affairs.

SUNY Upstate announced its plan to replace the use of live animals with “more valuable teaching methods” after the Physicians Committee filed a complaint with the United States Department of Agriculture explaining that the university was violating the federal Animal Welfare Act.

Simulab’s TraumaMan System, SynDaver’s Deluxe Cric Trainer, and CAE Healthcare’s Human Patient Simulator can be used to teach procedure skills taught in emergency medicine residency training.

Human-based methods are exclusively used by 86 percent of U.S. emergency medicine residency programs surveyed by the Physicians Committee, including Weill Cornell Medical College, Mount Sinai School of Medicine, SUNY at Stony Brook, and SUNY Downstate Medical Center.

Decades-Long Effort Revolutionizes University’s Medical Training

Oregon Health and Science University (OHSU) has announced that it will no longer use animals to train medical students—a decision that follows the Physicians Committee’s multiyear effort to promote human-relevant methods at the school.

“What we’ve learned in analyzing the outcomes from students and in our curriculum review is that there are alternatives to the use of live animals for teaching this aspect of physiology,” OHSU’s dean of undergraduate medical education wrote to the Physicians Committee in a June 9 letter. “Therefore, we have decided that the new curriculum will no longer include the use of live animals for teaching physiology.”

The university originally used live dogs in medical education, prompting the Physicians Committee to push for nonanimal teaching methods. Hoping to quell objections, the school switched to using pigs, but the Physicians Committee maintained that the university could eliminate animal use entirely. After many discussions, the university has made the switch.

In the United States, only Johns Hopkins University, the University of Tennessee College of Medicine at Chattanooga, Rush Medical College, and the University of Mississippi continue to use animals in medical student education.
Doctors Persuade Southern Illinois University to Use Human-Relevant Training

After a year-long campaign by the Physicians Committee, Southern Illinois University in Springfield has canceled its plan to add a live animal laboratory to its emergency medicine residency program. Instead, SIU will continue to use human-relevant teaching methods.

“There is no justification for using animals in medical training,” said John Pippin, M.D., F.A.C.C., Physicians Committee’s director of academic affairs. “Nonanimal teaching methods, like those the school was already using, offer a more effective—and humane—way to teach lifesaving procedures.”

Doctors with the Physicians Committee filed a federal rulemaking petition asking the USDA to eliminate gaps in its enforcement of Animal Welfare Act regulations to ensure that nonanimal alternatives will be used to the greatest extent possible. They also led a demonstration outside the SIU School of Medicine in October protesting the school’s planned use of animals.

The Physicians Committee has been encouraging SIU to cancel its plan to use animals since June 2013, and SIU postponed the plan several times as a result. Through a Freedom of Information Act request, the Physicians Committee has now confirmed that this animal lab is officially canceled.

Physicians Urge Johns Hopkins to Switch to Simulation

The Physicians Committee recently presented Johns Hopkins University School of Medicine with a petition signed by more than 120 Maryland doctors. The petition, delivered on Aug. 21, requested that the school use human-relevant methods instead of live animals for medical training.

Earlier in the day the doctors—including Richard Bruno, M.D., a Johns Hopkins resident—joined dozens of supporters in front of the medical campus holding signs and banners that read “Baltimore Deserves Better.”

Dr. Bruno supports a complete transition to human-based models. In his first year of medical training at Oregon Health and Science University (OSHU), Dr. Bruno and his classmates attended a training that used live animals.

“I recognized how unnecessary it was, but it was expected of students at the time,” said Dr. Bruno. “But as a result of medical students voicing their concerns, it has now been abandoned at OSHU.” The Physicians Committee and its members played a pivotal role in the end of the use of animals at OSHU (see page 9).

“Almost all medical schools have replaced animal labs with modern simulators which are greatly superior for learning surgical skills,” says Maryland physician Rhoda Ruttenberg, M.D.

Ninety-eight percent of schools now use human-relevant methods. Aside from Johns Hopkins, only the University of Tennessee College of Medicine at Chattanooga, Rush Medical College, and the University of Mississippi continue to use animals in medical student education.

**TAKE ACTION:**

**Ask University of Mississippi Medical Center to Modernize Medical Training**

Please ask University of Mississippi Medical Center (UMMC) School of Medicine to end the use of live animals in its physiology lab. High-fidelity human-patient simulators more accurately represent human anatomy. UMMC already has a state-of-the-art simulation center that can easily provide this training in an effective way. UMMC is one of only four medical schools in the United States and Canada that continue to use live animals for training.
Penny Marshall Urges Wayne State to Improve Heart Disease Research

In the first episode of the ’70s and ’80s sitcom Laverne & Shirley, Laverne and Shirley handcuffed themselves to a dog bound for euthanasia. By the end of the show they found the dog a home. Now, Penny Marshall, who played Laverne, is speaking out about dogs named Laverne and Shirley who died in heart failure experiments at Wayne State University.

“Tragically, a dog given my character’s name—as well as many others like her—met the opposite fate in horrific heart failure experiments at Wayne State University,” wrote Marshall in a letter to M. Roy Wilson, M.D., M.S., president of Wayne State. “Two decades of these experiments—which have not translated into benefits for Americans suffering from heart disease—is quite enough.”

Marshall also says that researchers have gained greater insight into the causes of heart failure from epidemiological studies and human clinical trials.

What’s Trending?
The Physicians Committee, of course. Here’s a sampling of recent news and social media mentions.

**TRENDING TWEETS**

It’s a full house at our #STOPDiabetes conference in Washington, D.C.

Penny Marshall of Lavern&Shirley is helping us #SaveWSUdogs! Join us at RogueExperiments.org @ WayneState

**FACEBOOK FAVES**

Visit PCRM.org/Blog to read these and other recent buzzed about blogs from Neal Barnard, M.D. • ALS Association: Put the Animal Experiments on Ice • 2015 Will Be the Year 4 out of 5 Doctors Agree: Plants Over Pills • Meat-Eating Falls to Lowest Levels in 3 Decades

**BLOG BUZZ**

CNN • “He began eating from the four food groups recommended by the Physicians Committee for Responsible Medicine: Fruits, vegetables, whole grains and legumes.” —from “Light bulb goes on: He lost 100 pounds with plant-based diet”

NPR • “Computer driven simulation technology has gotten incredibly sophisticated. You can do a virtual operation without touching an animal or patient or cadaver. You can learn the same techniques.” —Rhoda Ruttenberg, M.D., Physicians Committee member

U.S. News & World Report • “I don’t think hospitals are so different than food environments outside of hospitals… You see a trend where the public is demanding healthier food.” —Susan Levin, M.S., R.D., Physicians Committee director of nutrition education

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In 1974, a new book titled *We Never Went to the Moon: America’s Thirty Billion Dollar Swindle* alleged that NASA faked the lunar landing. In 2001, the Fox network broadcasted a documentary on the subject, and a follow-up survey showed that as many as one in five Americans doubted that Neil Armstrong’s boots had ever touched the moon’s surface.

Fast-forward to June 23, 2014. *Time* magazine’s cover proclaimed in large type “Eat Butter” and featured a big artistic swirl of the stuff. Several other publications—the *New York Times*, the *Wall Street Journal*, the *New Scientist*, and others—ran similar stories. The experts have been wrong all this time, the articles exclaimed. Fat isn’t unhealthy after all. Steak and pork chops won’t hurt you. Go ahead, dig in!

Of course, meat and dairy products are strongly linked to all manner of health problems, from heart disease to cancer, diabetes, obesity, and hypertension. So what is behind the contrarian stories?

**Eskimos and Maasai**

Some of the articles were based on a new book called *The Big Fat Surprise: Why Butter, Meat, and Cheese Belong in a Healthy Diet*. Its author, Nina Teicholz, aimed to rehabilitate meat’s image, starting with Eskimo and Inuit populations of the far north. They have almost no heart disease, she held, despite a diet heavy on fish and blubber. Was she right or wrong?

Wrong. A study from the University of Ottawa Heart Institute published in the *Canadian Journal of Cardiology* showed that cardiovascular disease has been at least as frequent among northern native populations as for others.¹ Strokes have been particularly common, and life expectancy overall was found to be about a decade shorter. Heart disease seemed rare among northern native populations mainly because reporting of medical problems has been spotty.
Teicholz then invoked the Maasai, an African population who are supposedly free of heart disease, despite a diet of meat, milk, and blood. Right or wrong?

Wrong. Researcher George V. Mann wrote in 1978, “We have collected hearts and aortae from 50 authenticated Maasai men who died of trauma and we found extensive atherosclerosis.”

Okay, so the Maasai’s arteries are clogged with atherosclerotic plaques. But they don’t have heart attacks, Teicholz maintained; so meat and milk must be safe. Right or wrong?

Wrong. Plaques that form in arteries can rupture, sparking the formation of a clot that blocks blood flow like a cork in an artery, causing a heart attack. Teicholz’s notion was that the Maasai have plaques, but the plaques somehow never rupture, like time bombs that never explode. This is highly unlikely. A better explanation for the lack of reported heart attacks among the Maasai comes from their tragically short life expectancy. If life is cut short in one’s 40s by an accident or an infection, plaques have not had enough time to produce a heart attack. Moreover, in a rural population with limited medical care and poor medical records, heart attacks may not be recognized or reported.

Ancel Keys and the Seven Countries Study

Teicholz and other fat-backers zeroed in especially on Ancel Keys, the University of Minnesota researcher who identified the dangers of fatty foods in the 1950s. Looking at six countries with reliable dietary and medical records, Keys found a clear association between fat intake and heart disease deaths.

But as Teicholz tells it, the rug was pulled out from under Ancel Keys by University of California at Berkeley statistician Jacob Yerushalmy. If Keys had zeroed in on more countries than just six, Yerushalmy held, the relationship between saturated fat and heart disease would have been weakened. In Teicholz’s words, it “nearly disappeared.” Right or wrong?

Wrong. Including additional countries, as Yerushalmy suggested, did muddy the correlation between fat and heart disease deaths, because many of these countries had poor data on diet or medical care at that time. Even so, the correlation between fat and heart deaths remained high, and the correlation between animal protein and heart deaths was even higher.

Meta-analysis

What really grabbed the headlines, however, was a meta-analysis published in early 2014 by the Annals of Internal Medicine. The meta-analysis combined 72 smaller studies, finding no overall effect of saturated fat on heart risks. According to the fat lobby, that proved that “bad” fat isn’t bad for your heart after all. Right or wrong?

Wrong. The Annals meta-analysis combined data from many studies. Some were designed to accurately show the dangerous effects of saturated fat. The designs of other studies did not make the hazards of saturated fat readily apparent. The net result was that the two types of studies canceled each other out, showing no risks. For example, take these two studies the Annals meta-analysis included:

The Oxford Vegetarian Study included 11,000 people whose diets ranged from vegan to ovolactovegetarian to non-vegetarian, with saturated fat intake ranging from a low of 6 percent of calories to more than 13 percent of calories. The study found that the fattiest diets tripled the risk of dying of heart disease, compared with diets that had very little saturated fat.
Putting It Into Practice
By Neil Cooper, M.D.

But in a Swedish study, no groups were on lower-fat diets. All of the study groups averaged more than 13 percent of their calories from saturated fat. Not surprisingly, the study could not identify any effect of avoiding saturated fat, because no groups in the study had a low fat intake.

Is Meat Safe or Not?

Of course, no one orders saturated fat at a restaurant or puts it on a shopping list. This fat is hidden in meat, dairy products, and other foods. And here, the evidence is crystal clear. Meat-eaters are heavier than people who avoid meat. They have higher blood pressure, higher risk of diabetes, cancer, heart disease, and many other problems. And in carefully controlled studies, when people take meat out of their diets, they lose weight, and cholesterol, diabetes, and heart disease all improve.

So while researchers debate the statistics on saturated fat, it pays to remember that getting away from meat is a healthy choice.

So how could the media have been duped? As John McDougall, M.D., said, people are always looking for good news about bad habits.


Read about Dr. Cooper’s inspiring personal journey to health in this month’s Physician Profile on the back cover.
Major League Baseball Asked to Strike Out Hot Dogs

The Physicians Committee surveyed all 30 Major League Baseball stadiums this summer and found supersized hot dogs piled high with saturated fat and cholesterol. A new report asks the stadiums to stop serving this processed meat product that puts fans at risk for cancer, type 2 diabetes, and heart disease.

High in calories, saturated fat, cholesterol, carcinogens, and sodium, all of baseball’s hot dogs can lead to hypertension, heart disease, diabetes, and various cancers. Processed meat products are so closely linked to cancer that the World Cancer Research Fund warns that no quantity is safe.

The Arizona Diamondbacks are offering fans an 18-inch-long corn dog wrapped in bacon and stuffed with cheese, which weighs in at 3,000 calories. In Milwaukee, the Brewers earned three strikes for stacking three types of processed meat onto one hot dog. The Cincinnati Reds’ Meat Lover’s Hot Dog, which is wrapped in bacon, deep fried, and topped with chili, cheese, and crispy fried salami, contains 88.2 grams of fat.

The report urges Major League Baseball to think about America’s future by promoting menus filled with fresh fruit, vegetables, and whole grains. It also highlights stadiums that already offer healthful, plant-based options. At AT&T Park in San Francisco, Giants fans can enjoy fresh avocados, lemons, cucumbers, strawberries, and more grown in a vegetable garden in the stands near the outfield. The team has incorporated the fresh produce into a new garden concession stand featuring vegetable flatbreads, strawberry smoothies, and kale salads.

Complete Nutrition: The Power Plate and B12

The Power Plate brings you healthful nutrition. In addition, it is essential to have a source of vitamin B12. Drugstores and health foods stores sell B12 supplements, as well as “B complex” (a mixture of B-vitamins), including B12. All typical brands have more than the 2.4 micrograms adults need, and there is no toxicity from higher amounts. Fortified breakfast cereals, fortified soy milk, and fortified meat analogues often supply the vitamin, as well.

ONLINE> Learn more about the dangers of hot dogs and other processed meats at DropTheDog.org.

ONLINE> Learn more at PCRM.org/B12.
Congress Gets a Taste of Healthful, Plant-Based School Lunches

Children deserve better than pepperoni pizza dripping with grease and fatty burgers piled with cheese. It’s not a revolutionary idea—but it’s a message Congress needs to hear at a time of intense debate surrounding school food standards. This summer, the nation’s school lunch leaders traveled to a Physicians Committee briefing on Capitol Hill to tout the benefits of boosting the veggies and nixing the meat for students’ health and academic success.

The standing-room-only event gave congressional staffers a taste of a plant-based lunch inspired by DC Central Kitchen’s own school menu. Black bean burritos, Mexican corn salad, roasted zucchini, and fresh summer berries and melon were served on school lunch trays alongside individual cartons of soy milk.

“It’s not acceptable that this generation won’t have the same lifespan as their parents,” said Darlene Moppert, M.S., R.D., nutrition program manager for Broward County Public Schools, the sixth largest school district in the country. Moppert described her district’s successful efforts—aided by the Physicians Committee—to offer daily vegan meals to nearly a quarter of a million students.

“We need vegetarian choices every meal, every day,” said Ann Cooper, nutrition services director of Boulder Valley School District in Colorado.

Robert Groff, principal of TALES, the all-vegetarian public school in New York, and Andy Finke, chief operating officer of DC Central Kitchen, stressed that there is a clear connection between nutrition education and academic achievement.

The July 1 event was the second in a series of congressional briefings on school lunch. The series is part of a multiyear effort to improve plant-based offerings in school cafeterias through legislative advocacy and community-level programs.

Are You a Physician with a Passion for Disease Prevention?

The Physicians Committee has a career opportunity for doctors to treat patients and help them prevent nutrition-related chronic diseases at Barnard Medical Center, opening in 2015 in Washington, D.C. Interested physicians should send a cover letter and résumé to careers@pcrm.org.
International Conference on Diabetes Calls for Dietary Interventions

Nearly 18 million new cases of diabetes are expected by next year. But on July 18 and 19, hundreds of health care providers and researchers from around the world gathered in Washington, D.C., to discuss dietary interventions as first-line diabetes treatment.

The International Conference on Diabetes, jointly sponsored by the Physicians Committee and The George Washington University School of Medicine and Health Sciences, featured 35 global scientists presenting on many aspects of diabetes research. Among the recommendations was a plant-based diet for preventing and managing diabetes.

Physicians Committee president Neal Barnard, M.D., concluded the conference with a call to action for conference attendees and for the 6 million people the conference reached through social media: “We have enough research that shows a diet rich in fruits, vegetables, and beans will significantly reduce the risk of chronic disease. Why wait?”

Caroline Trapp, M.S.N., C.D.E., director of diabetes education and care for the Physicians Committee, premiered the Physicians Committee’s new DVD documentary The Power to Heal Diabetes: Food for Life in Indian Country and gave a copy to each conference attendee.

More than a dozen poster presentations included Diabetes and the Navajo Nation and the Physicians Committee’s Nutrition Intervention for Diabetic Neuropathy study.

Guests feasted on low-fat, vegan breakfasts, lunches, and dinners.

Thanks to International Conference on Diabetes Sponsors
Join Us for a Sublime Evening!

Mark your calendar for Friday, March 13, and join us for a fabulous night of world-class food and fun at Nanci Alexander’s spectacular Sublime restaurant in Fort Lauderdale, Fla. Space is limited. Purchase tickets at PCRM.org/Events or call Anne Marie Vastano at 202-717-8662.

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E-mail us at bwason@pcrm.org or call us at 202-686-2210, ext. 366, so that we can assist you through every step of the process.

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Inspiring Hearts in the Hamptons

It was a wonderful evening on Saturday, Aug. 9, in Amagansett, N.Y! Guests from across the country travelled to John Bradham’s home in the Hamptons to support the Physicians Committee and share an evening filled with big ideas and big plans—and to provide big support for the lifesaving changes being brought about by the Physicians Committee. The event featured delicious food prepared by SuiteThreeOhSix, nondairy Treeline Cheese, and Vegan Treats, and music by DJ Stretch Armstrong and Paul Gene. Many thanks to our host, guests, and event committee for making this event so enjoyable and such a big success! For more details and to view event photos, please visit PCRM.org/Events.

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Ann Cile Esselstyn, Jane Esselstyn
In a much-anticipated cookbook, this mother-daughter team share more than 125 delicious and nutritious recipes that make it easy to follow Dr. Caldwell Esselstyn’s lifesaving dietary advice from his bestselling book Prevent and Reverse Heart Disease. 320 pgs, $25.00

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Over 100 Vegan Recipes to Glow from the Inside Out
Angela Liddon
Done with feeling sick and tired, Angela Liddon threw out her fat-free butter spray and low-calorie frozen dinners. Instead, she embraced whole foods that made her glow from the inside out. Today, Liddon authors one of the most popular vegan recipe blogs on the planet, spreading the word about the powerful transformation that food can make. A New York Times bestselling author, and former professional triathlete. Hardcover, 71 pgs, $11.95

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Neal D. Barnard, M.D., Editor
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Healthy Recipes from Exclusive and Out-of-the-Way Restaurants
Jennifer L. Keller, R.D., Editor
Travel around the world to discover treasures from side-street cafes and elegant hotel dining rooms. Attractively illustrated, this delightful vegan cookbook is the sequel to PCRM's original international recipe collection. Hardcover, 71 pgs, $11.95

The Best in the World III
Healthy Recipes from Exclusive and Out-of-the-Way Restaurants
Neal Barnard, M.D., Editor
Discover delicious and unique recipes from restaurants across the globe. Join monks in a temple courtyard in the Far East, passengers on a French luxury yacht, or even a rock star in Akron, Ohio, for an unforgettable culinary adventure. Often exotic and always flavorful, these plant-based recipes are designed to be within the abilities of any amateur chef. Hardcover, 71 pgs, $11.95

The Allergy-Free Cook Bakes Cakes and Cookies
Virginia Messina, JL Fields
This book is designed for anyone who needs to avoid gluten, dairy products, and other common food allergens but doesn't want to feel deprived. Now those with food sensitivities can fearlessly indulge in delicious baked goods. Learn how to interpret food labels, prevent cross-contamination, and make ingredient substitutions. 144 pgs, $14.95

My Beef with Meat
The Healthiest Argument for Eating a Plant-Strong Diet, Plus 140 New Engine 2 Recipes
Rip Esselstyn
Get facts, inspiration, and recipes from a firefighter, best-selling author, and former professional triathlete. Esselstyn debunks diet myths and puts the reader on track to lose weight and feel great! Hardcover, 288 pgs, $25.00

Artisan Vegan Cheese:
From Everyday to Gourmet
Miyoko Schinner
Create tempting nondairy cheeses that retain all the complexity and sharpness of their dairy counterparts. Schinner explains how to make aged cheeses, air-dried cheeses, meltable cheeses, and almost-instant cheeses, as well as nondairy sour cream, yogurt, and whipped cream. Includes recipes that use nondairy cheeses. 149 pgs, $19.95

Afro-Vegan
Farm-Fresh African, Caribbean, and Southern Flavors Remixed
Bryant Terry
African, Caribbean, and Southern foods are all known and loved as vibrant and flavor-packed cuisines. In Afro-Vegan, renowned chef and food justice activist Bryant Terry reworks and remixes the favorite staples, ingredients, and classic dishes of the African diaspora to present wholly new, creative culinary combinations that will amaze vegans, vegetarians, and omnivores alike. 224 pgs, $27.50

Vegan for Her
The Woman’s Guide to Being Healthy and Fit on a Plant-Based Diet
Virginia Messina, JL Fields
This book is designed for anyone who needs to avoid gluten, dairy products, and other common food allergens but doesn't want to feel deprived. Now those with food sensitivities can fearlessly indulge in delicious baked goods. Learn how to interpret food labels, prevent cross-contamination, and make ingredient substitutions. 144 pgs, $14.95

The Great Life Cookbook
Whole Food, Vegan, Gluten-Free Meals for Large Gatherings
Priscilla Timberlake, Lewis Freedman, R.D.
Every Friday night for more than 17 years, the authors have been cooking for friends and family. Explore their monthly dinner menus and dare to cook wholesome and delicious vegan dishes for your group! 96 recipes, from soup to dessert arranged in 12 seasonal menus. 240 pgs, $26.50

The Sublime Restaurant Cookbook
South Florida’s Ultimate Destination for Vegan Cuisine
Nanci Alexander
The flavors and beauty of south Florida's award-winning Sublime Restaurant are compiled here with some of Sublime's most famed culinary creations. From Asian, Latin, or Mediterranean influences to more typical American fare, each recipe is delightfully conceived, beautifully presented, and yet surprisingly quick to prepare. 117 pgs, $19.95
From Neal D. Barnard, M.D., PCRM president

Power Foods for the Brain
An Effective 3-Step Plan to Protect Your Mind and Strengthen Your Memory
In *Power Foods for the Brain*, Dr. Neal Barnard has gathered the most important research and studies to deliver a program that can boost brain health, reducing the risk of Alzheimer’s disease, stroke, and other less serious problems, including low energy, poor sleep patterns, irritability, and lack of focus. 320 pgs, $16.00

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Boost Metabolism, Lower Cholesterol, and Dramatically Improve Your Health
Based on PCRM’s popular online Kickstart program, Dr. Barnard’s 21-Day Weight Loss Kickstart will help you get fast results: drop pounds, lower cholesterol and blood pressure, improve blood sugar, and more. With more than 60 recipes, daily meal plans, and tips for grocery shopping, this book will get you on the fast track to better health. 368 pgs, $15.99

The Get Healthy, Go Vegan Cookbook
125 Easy and Delicious Recipes to Jump-Start Weight Loss and Help You Feel Great
These recipes are based on Dr. Neal Barnard’s landmark two-year study, which shows that a vegan diet effectively controls type 2 diabetes. In fact, it’s also beneficial for weight loss, the reversal of heart disease, and the improvement of many other conditions. Dr. Barnard and nutritionist Robyn Webb offer easy, delicious meals to improve your health. 248 pgs, $18.95

A New Approach to Nutrition for Diabetes DVD
Turn back the clock on diabetes through a low-fat vegan diet. In eight compelling lessons, Dr. Barnard explains his groundbreaking research and how to put it to work in your life. Includes cooking demonstrations by chef Toni Fiore and a grocery store tour by Susan Levin, R.D., and Caroline Trapp, M.S.N., C.D.E. 192 mins, $19.95

Dr. Neal Barnard’s Program for Reversing Diabetes
If you have diabetes or are concerned about developing it, this program could change the course of your life. Dr. Barnard’s groundbreaking clinical studies, the latest funded by the National Institutes of Health, show that diabetes responds dramatically to a low-fat, vegetarian diet. Rather than just compensating for malfunctioning insulin like other treatment plans, Dr. Barnard’s program helps repair how the body uses insulin. Includes 50 delicious recipes. 288 pgs, $15.99

Tackling Diabetes with Dr. Neal Barnard
Drawing on the latest scientific research, Dr. Barnard explains how a low-fat vegan diet can fight diabetes by controlling blood glucose, weight, and heart disease risk. In many cases, it will even eliminate the need for some medications. 60 mins, $9.95

Food That Fight Pain
Did you know that ginger can prevent migraines and that coffee sometimes cures them? Drawing on new research, Dr. Barnard shows readers how to soothe everyday ailments and cure chronic pain with common foods. 348 pgs, $14.95

Breaking the Food Seduction
We all have foods we can’t resist, foods that sabotage our health. But banning those cravings for chocolate, cookies, cheese, or burgers isn’t a question of willpower; it’s a matter of biochemistry. Drawing on his own research and that of other leading institutions, Dr. Barnard reveals how diet and lifestyle changes can break the craving cycle. 324 pgs, $16.99

Turn Off the Fat Genes
Genes, including those that shape our bodies, actually adapt to outside influences. Dr. Barnard explains the process and provides a three-week gene-control program complete with menus and recipes by Jennifer Raymond. Here are powerful tools for achieving long-term weight loss and better health. 350 pgs, $16.00

A Physician’s Slimming Guide for Permanent Weight Control
You can succeed in becoming and staying slimmer! This book is not a diet—it’s a program that takes the reader beyond artificial “formula approaches.” 96 pgs, $7.95

From PCRM

Forks Over Knives—The Cookbook
Del Sroufe
Sroufe, the man behind some of the mouthwatering meals in the film, proves that the *Forks Over Knives* philosophy is not about what you can’t eat, but what you can. Chef Del and his collaborators transform wholesome fruits, vegetables, grains, and legumes into 300 recipes—classic and unexpected, globally and seasonally inspired, and for every meal of the day. 320 pgs, $18.95

Food for Life 90-Day Journal
This portable spiral notebook helps you keep a daily record of fiber intake and physical activity. Additional features include a seven-day sample menu, 22 recipes, tips for breaking food cravings, pantry suggestions, how to track fiber intake and body mass index, recommended resources, and plenty of inspiration from PCRM. 144 pgs, $12.00, discount price $10.99

The Nutrition Rainbow Poster
The more naturally colorful your meal is, the more likely it is to have an abundance of cancer-fighting nutrients. Pignments that give fruits and vegetables their bright colors represent a variety of protective compounds. The Nutrition Rainbow poster shows the cancer-fighting and immune-boosting power of different-hued foods. 17”x22”, $6.00

The Cancer Survivor’s Guide
Neal Barnard, M.D., Jennifer Reilly, R.D.
Find out how foods fight cancer and the advantages of a high-fiber, low-fat, dairy- and meat-free diet. Includes updates from the latest research, special prostate and breast cancer sections, tips for making the dietary transition, and more than 130 recipes. 245 pgs, $19.95

Eating Right for Cancer Survival DVD
Neal Barnard, M.D., Chef Sualua Tupolo, Stephanie Beine, R.D.
This exciting 2-disc set is designed to work hand in hand with the companion book, *The Cancer Survivor’s Guide*. Nine nutrition presentations and nine cooking lessons provide powerful tools for making changes in health and well-being. 270 mins, $19.95
Unlocking the Power of Plant-based Nutrition DVD Series
You can buy all three Unlocking the Power of Plant-based Nutrition DVDs—Food for Life, Weight Control, and Heart Health—for $29.95. That’s a savings of nearly $15. Each disc features the segments “Getting Started” with Neal Barnard, M.D., and “In the Kitchen” with TV’s Totally Vegetarian Chef Toni Fiore. Discs average 58 minutes in length. $29.95

Fix Your Mood with Food
The ‘Live Natural, Live Well’ Approach to Whole Body Health
Heather Lounsbury
Use methods practiced in Chinese medicine to improve mood naturally without the use of drugs. By working to cure the entire body, Lounsbury’s book guides readers to elevate mood naturally as they improve (and prevent) a variety of physical ailments, including heart conditions, high cholesterol, digestive issues, headaches, and energy problems. 224 pgs, $16.95

Kitchen Divided
Vegan Dishes for Semi-Vegan Households
Ellen Jaffe Jones
What do you do if you’re vegan, but your spouse—or your child or parent—is not? This diplomatic and practical guide addresses the heated issues that can arise when vegans and meat-eaters share the same kitchen. Streamline meal preparation so you can juggle the demands of cooking—even if you and your family members never end up on the same page of the menu. 160 pgs, $19.95

The China Study Cookbook
Over 120 Whole Food, Plant-Based Recipes
LeAnne Campbell, foreword by T. Colin Campbell
Based on the most comprehensive nutrition study ever conducted, this book introduces plant-based recipes that can lead to optimal health and fight many diseases. Filled with helpful tips on substitutions, keeping foods nutrient rich, and changing to a plant-based diet. 208 pgs, $19.95

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<th><strong>Just the Facts</strong></th>
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<td><strong>Animals Make Ethical Choices</strong></td>
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<td>Research presented at the American Psychological Association’s annual meeting shows that it’s not just humans who believe that fair’s fair—monkeys and dogs can evaluate the equity of a situation. Chimpanzees and capuchin monkeys will refuse a reward for a task completed with a partner if the partner receives a better reward.</td>
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| **Tick’s Cause Meat Allergy** |
| Lone star ticks have re-emerged this summer, spreading across the United States. This bug’s bite can cause people to develop hives, breathing problems, a drop in blood pressure, or anaphylactic shock after eating red meat or dairy products. |

| **Australia Says No to McDonald’s Promotion** |
| The Australian Advertising Standards Bureau has decided that handing out McDonald’s food vouchers to children violates requirements for responsible advertising to children. |

| **The Nose Knows Nutrition** |
| Florida State University released a study showing that high-fat diets can damage a person’s sense of smell. |

| **Ancient Egyptians Were Mainly Vegetarian** |
| New research published in the *Journal of Archaeological Science* found that the ancient Egyptians followed mostly vegetarian diets. |

| **Chimpanzees Follow Fads, Too** |
| When a chimpanzee named Julie started putting a blade of grass on her ear, most of the other chimps at the Zambian sanctuary followed suit, showing that chimpanzees also develop behavior trends. |

| **Tomatoes Protect Prostates** |
| Men who eat more than 10 portions of tomatoes a week have an 18 percent lower risk of prostate cancer, according to a recent study in *Cancer Epidemiology, Biomarkers and Prevention*. Prostate cancer is the most common cancer among American men. |

| **Dog Days Are Over** |
| Tyson Foods is shutting down three factories in Iowa, New York, and New Mexico due to a decreased demand for hot dogs and other processed meat products. |

| **Don’t Play with Your Food** |
| Dimethylpolysiloxane is a key ingredient in McDonald’s Chicken McNuggets—it’s also one of the building blocks of Silly Putty. |
As a physician with a few decades of practicing medicine under my belt, I never thought it would happen to me," says Neil Cooper, M.D. At age 56, Dr. Cooper was in reasonably good physical shape. So when struck with chest pain, he was certain it wasn’t cardiac in origin. But within a few hours he was on the operating table with a stent in his artery. He credits the Physicians Committee with helping him turn a crisis into a success story that guides his friends, colleagues, and patients toward more healthful lives.

“It was this serious threat to my own health that led me to a new life—and to a career that would save the lives of many others,” Dr. Cooper said.

Long before his heart attack, Dr. Cooper realized that the acute therapies he provided for vascular disease weren’t always treating the underlying cause of his patients’ blocked arteries.

“My own heart problems motivated me to find a better solution that would restore my health and that of my patients, giving them more than just the absence of disease but a truly vibrant life,” Dr. Cooper explains.

Dr. Cooper found this solution when he attended the Physicians Committee’s three-day Kickstart Intensive program in Washington, D.C., where he was encouraged to “test drive” a vegan diet.

“Diving into research on the topic, I discovered that this way of eating had been proven to not only treat but actually reverse even the most deadly chronic diseases—including heart disease,” continues Dr. Cooper. “I had more energy, better sleep, and lower cholesterol and lipid levels than when I was in my 30s.”

Deeply inspired and physically rejuvenated, Dr. Cooper went back to school, determined to build a new career to pass this lifesaving information on to his patients and colleagues. He became a certified personal trainer and earned two master’s degrees: one in health administration and another in science in health promotion.

At Kaiser Permanente, Dr. Cooper serves on multiple committees to promote health and wellness for employees as well as patients. In recognition of his commitment to improving personal health and the health of others, Dr. Cooper was awarded the Personal Lifestyle Award by The Southeast Permanente Medical Group last year.

“My deepest passion is helping other health care providers promote plant-based diets and exercise to their patients as revolutionary ways to prevent and treat disease,” says Dr. Cooper.

See page 14 for Dr. Cooper’s Putting It Into Practice tips for health care professionals.