

## An Rx for preventing heart attacks

**G**iven that actor John Candy was an overweight smoker with poor eating habits, it's not surprising that a massive heart attack killed him at age 43.

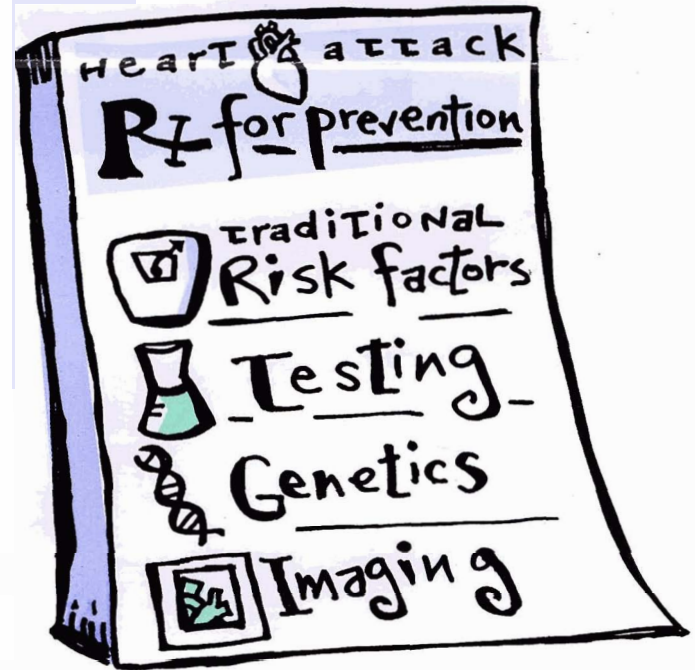
But what about Winston Churchill?

Also an overweight smoker, the British leader had no known heart problems and died at 90.

Part of the answer is in their genes, says genetics expert Dr. Helen Hobbs of UT Southwestern, who compared the two men at a Friends of the Center for Human Nutrition meeting in early May. The comparison illustrates how hard it is to identify people at risk of heart disease and the need for a new approach to find such people.

Dr. Hobbs is taking a new approach – "A Prescription for Prevention" – to look at genetics, traditional risk factors, testing and imaging in hopes of identifying a person's susceptibility to heart disease.

"If you put these things together, you have a way to identify people at risk and intervene earlier so heart problems never occur," said Dr. Hobbs, director of the Eugene McDermott Center for Human Growth and Development, director of the Donald W. Reynolds Cardiovascular Clinical Research Center and a Howard Hughes Medical Institute investigator at UT Southwestern.



*Continued on page 2*



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## PRESCRIPTION

Continued from page 1

**D**r. Hobbs' "prescription" has four goals:

### Traditional risk factors.



Further investigate the functions and origins of cholesterol, etc., to develop new treatments and prevention methods.



### Blood/urine testing.

Identify levels of cholesterol and other elements in the body related to heart disease.



### Genetics.

Look at a person's DNA find variations that might those who are more at risk of heart disease and those who aren't.



### Imaging.

Use different imaging techniques to measure how much fat a person has, how it's distributed in the body and its role in heart disease.

To put the approach into practice, Dr. Hobbs, who holds the Eugene McDermott Distinguished Chair for the Study of Human Growth and Development and the Dallas Heart Ball Chair in Cardiology Research, is using the Dallas Heart Study.

This groundbreaking investigation of cardiovascular disease, begun in 1999 and funded by the Donald W. Reynolds Foundation, has yielded detailed medical histories from more

than 6,000 Dallas County residents. More than half of the residents also gave blood and urine samples and went through advanced imaging techniques.

Researchers are using the information to identify new drug targets for preventing and treating heart disease and identifying a person's risk for it, Dr. Hobbs said.

Her team already has identified genetic defects that cause extremely high levels of cholesterol and heart attacks at an early age. Her team has also identified genetic differences that result in lower plasma

cholesterol levels and protect from heart disease.

More recently, in a study published in the journal *Science* on May 3, Dr. Hobbs and Dr. Jonathan Cohen, professor of internal medicine and in the McDermott Center for Human Growth and Development and an investigator in the Center for Human Nutrition, together with their colleagues, identified a genetic region that increases some Caucasians' risk of coronary heart disease by up to 40 percent, regardless of other risk factors like high blood pressure and cholesterol. They found this region **by studying the genetic blueprints of thousands of people, including some from Dallas, with and without heart disease.**

"We're trying to figure out the reason why individuals with the genetic region have more heart disease," Dr. Hobbs said. "It is a mystery since there are no known genes in the region."

Genetics, though, didn't even factor into the equation a few years ago.

"Researchers thought genetics was an interesting subject but it was not something we could do much about," said Dr. Scott Grundy, director of the Center for Human Nutrition and holder of the Distinguished Chair in Human Nutrition.

"But that perception is changing rapidly thanks to Dr. Hobbs, Dr. Cohen, [who holds the C. Vincent Prothro Distinguished Chair in Human Nutrition Research] and others at UT Southwestern."

Dr. Grundy's Center for Human Nutrition, for example, is collaborating with the Obesity Alliance, a group of UT Southwestern scientists who investigate the behavioral, metabolic and molecular mechanisms that cause obesity and metabolic syndrome. Obesity Alliance researchers focus on everything from diet to genes to biology.

Other researchers from UT Southwestern are trying to find ways to prevent and treat the harmful enlargement of the heart and uncover whether stem cells from adult heart or bone marrow can repair an injured heart.

"These are areas where UT Southwestern is making advances by leaps and bounds," Dr. Grundy said.

More advances are expected as the Dallas Heart Study continues, as Dr. Hobbs hopes to expand the reach of the study to include obesity, cancer, Alzheimer's disease and other conditions.

Her longstanding goal is to identify the genetic factors that contribute to variations in the plasma levels of cholesterol in the blood, especially to levels of low-density lipoprotein cholesterol, or LDL – the "bad" cholesterol. High LDL levels promote cholesterol accumulation in artery walls, which increases the risk of a heart attack.

The bottom line, Dr. Hobbs said, is identifying people at risk so doctors can intervene and prevent conditions such as heart disease from ever occurring.

"Right now, 50 percent of men are going to have a heart attack," she said. "The questions we're left to ask are, 'Who are these guys?' and 'Can we find them?'" ❧

## Dr. Grundy joins ranks of worldwide scientific elite

**D**r. Scott Grundy, director of the Center for Human Nutrition, has joined an elite worldwide group of 17 scientists with multiple research papers among the most-cited publications from 2005-06, according to *Science Watch*.

*Science Watch*, which tracks trends in basic research, listed researchers with at least five "hot papers" – works that attracted far more attention than those of the same age and field.

An immunologist from Osaka University in Japan topped the list with seven hot papers.

Dr. Grundy's five hot papers, which focused on the metabolic syndrome, lipids and heart disease, were the most of any researcher in the field of nutrition or metabolism.

Just one other Texas researcher, Dr. Aman Buzdar of the UT M.D. Anderson Cancer Center, who also had five hot papers, was on the list.

"Being a part of this list is a great compliment, especially given that a good measure of the importance of published research is how many times other scientists cite it in their own work," said Dr. Grundy, who holds the Distinguished Chair in Human Nutrition at UT Southwestern.

Dr. Grundy has published more than 300 papers in the areas of cholesterol, lipoprotein metabolism and heart disease. His major accomplishments include developing methods to measure cholesterol balance, identifying the metabolic causes of cholesterol gallstones,

defining the effects of saturated, unsaturated and monounsaturated fats on cholesterol and lipoprotein metabolism, and defining the mechanisms of several lipid-lowering drugs.

Dr. Kern Wildenthal, president of UT Southwestern, said, "The *Science Watch* ranking recognizes Dr. Grundy's stature as a top researcher in the field of nutrition and metabolism, and further validates the reputation of UT Southwestern's faculty as one the world's most outstanding and influential." ❧



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— DR. SCOTT GRUNDY

## A few home-based tips can help fight childhood obesity

**Y**ou've heard the alarming statistic before: One-third of U.S. children and teens are overweight or obese, increasing their risk of developing health problems such as diabetes.

But what can the typical parent do to prevent childhood obesity?

Cindy Cunningham, assistant professor of clinical nutrition at UT Southwestern, has a few tips that can help a child stay healthy: **Help babies avoid weight issues from the start of life.**

Even people who have a genetic tendency to be overweight can avoid

excessive weight gain with good nutrition and exercise. Start with breastfeeding, and then introduce solid foods when the baby is developmentally ready, around 4 to 6 months of age. Learn to recognize your child's hunger signs, and do not use food as a pacifier. Throughout childhood maintain family meals, and be a good role model. Mealtimes should be happy times.

**Promote healthy eating.**

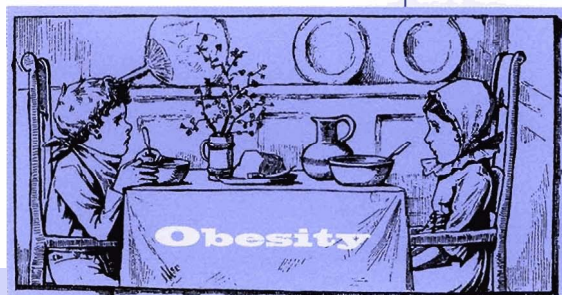
Keep portions small, and allow children to get a second helping if they're still hungry. Keep healthy food and snack options, such as fruit, stocked in the kitchen.

Don't give up on offering healthy foods, as it might take several tries before a child will accept them. Use low-calorie substitutes when cooking meals, such

as low-fat cheese and nonfat milk. **Know the importance of dairy products.**

Some studies have shown that dieters on low-calorie diets lost more weight and fat if they consumed three servings of dairy a day, but other studies have not supported these findings. While more research is needed in this area for a definite answer, it is important that children have two to three servings of dairy a day for calcium and vitamin D. **Know what Body Mass Index means.**

Body Mass Index (BMI) is derived from dividing weight in kilograms by height in meters squared to determine a child's weight relative to height. It is not a measure of body fat. It is important for health professionals to follow the BMI of children older than 2 to track their weight and height at various ages and to look for growth trends. ❧



## Obesity-fighting force unites to battle epidemic

**A**s obesity expands the waistlines and endangers the health of millions of Americans, UT Southwestern has assembled a unique team of scientists and nutritionists to attack the epidemic from every angle.

The Task Force for Obesity Research brings together dozens of the best scientists from several different fields to investigate the behavioral, metabolic and molecular mechanisms that cause obesity and metabolic syndrome.

Dr. Scott Grundy, director of the Center for Human Nutrition at UT Southwestern and a member of the task force, has high hopes for the obesity-fighting force.

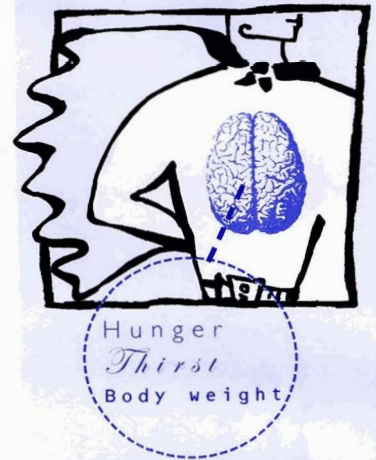
"This is going to be key for our treatment of the emerging problem of obesity, not only as a nutrition problem, but also as a broad medical problem," Dr. Grundy said.

The task force is divided into four interconnected research groups that study certain metabolic aspects, such as molecular biology and human genetics.

Combined, the groups have three main objectives:

- **Foster** interdisciplinary interactions to study obesity and metabolic syndromes;
- **Develop** state-of-the-art research programs using genetically modified mice to elucidate the metabolic and molecular bases of obesity and metabolic syndromes throughout the body; and
- **Support** translation of scientific findings made in animal models to humans.

"We're integrating the traditionally disparate disciplines of nutrition, neuroscience, endocrinology, genetics, lipid metabolism, psychiatry and clinical epidemiology to focus on a single disease," said task force leader Dr. Jay Horton, who is also an associate professor of internal medicine and molecular genetics, and holds the Dr. Rubert C. and Veronica Atkins Chair in Obesity and Diabetes Research. "Doing so will lead to better understanding of the processes that lead to obesity and related diseases, such as cardiovascular disease, hypertension, diabetes and fatty liver disease."



**"It's really important**

**to understand how the hypothalamus works and how it controls how much food you eat, how much energy you burn, and how you maintain your body weight and glucose state."**

— Dr. Joel Elmquist

Three task force members exemplify how the task force operates and what kind of work is done.

**Dr. Joel Elmquist:**

*Investigating hypothalamic molecular pathways*

The hypothalamus is the only region of the brain that humans can't live without because of its importance in maintaining all bodily functions.



Hunger, thirst and body weight also are controlled in this region.

Dr. Joel Elmquist, professor of internal medicine and director of the Division for Hypothalamic Research, said it's vital to identify molecular pathways that regulate body weight, appetite and glucose homeostasis in the hypothalamus.

"It's really important to understand how it works and how it controls how much food you eat, how much energy you burn, and how you maintain your body weight and glucose state," Dr. Elmquist said. "This can help fight the obesity and diabetes epidemics."

Dr. Elmquist's recent studies have shed light on how the brain chemical serotonin, when spurred by diet drugs such as Fen-phen, works to curb appetite. His ongoing work in this area could aid in the design of safer anti-obesity drugs nearly a decade after Fen-phen was banned for causing harmful side effects.

His work also reinforces the role of serotonin – a regulator of emotions, mood and sleep – in affecting the brain's melanocortin system, a key molecular pathway that controls body weight.

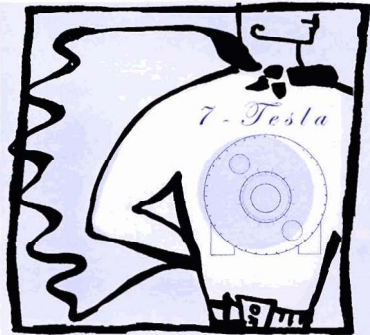
#### **Dr. Craig Malloy:**

Magnetic keys to metabolic questions

How do researchers measure metabolic processes in mice or humans?

Dr. Craig Malloy, professor of internal medicine and medical director of the Advanced Imaging Resource Center at UT Southwestern, is using extremely powerful magnets to develop novel imaging methods for the analysis of mice and human metabolism – a key ingredient in the fight against obesity.

"Magnetic resonance imaging (MRI) devices help us better understand intracellular fat so we are able to match the treatment to individual patients," said Dr. Malloy, holder of the Richard A. Lange, M.D., Chair in Cardiology.



A major component of this research is the 7-Tesla magnet, which works like a standard MRI device but has the power that makes it one of the strongest tools for scientific and biological study in the world. It allows investigators to examine tiny metabolic processes in action in the body or peer deeply into the living human brain.

The magnet can detect fat cells stored in skeletal muscles or the heart, or help find out how blood-glucose works and how it triggers serious health complications.

"The concentration of glucose in the blood is the culprit in a lot of health problems," Dr. Malloy said. "So we can use this technology to produce high-resolution imaging that allows us to study these processes and diseases."

#### **Dr. Elizabeth Parks:**

Breaking down liver function

The liver is another key site in the fight against obesity.

Dr. Elizabeth Parks, associate professor of clinical nutrition and a nutrition scholar in the Center for Human Nutrition, traces and tracks

**"We can use this technology to produce high-resolution imaging that allows us to study these processes and diseases."**

— Dr. Craig Malloy

different substances in the liver that produce fat. The important part, she says, is how long the fat stays in the blood.

The longer fat remains, the more prone a person is to develop diabetes and metabolic disorders.

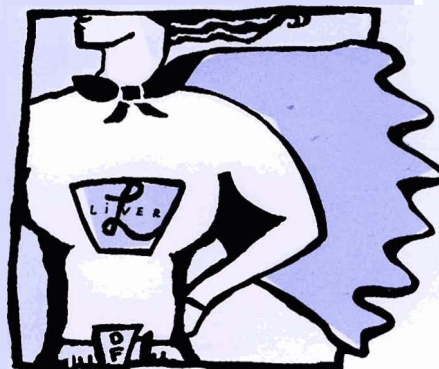
"If you walk leisurely in the morning, the body releases fat into the blood, and it circulates in the blood for a time before it enters organs like the muscle to be burned up," she said. "If you quicken your pace, that process takes two minutes. If you are sitting at a desk, the process can take 45 minutes."

In her laboratory research, Dr. Parks uses stable isotopes and mass spectrometry to characterize metabolic fluxes in humans and mice. Her work was the first to determine the source of fatty acids that accumulate in hepatic steatosis and to demonstrate the importance of liver lipid synthesis in the pathogenesis of fatty liver.

"Is fat being stored, burned or ending up in the liver?" Parks said. "Those are the important questions we are trying to answer." ❧

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— Dr. Elizabeth Parks



## Try some new foods for an immune-system booster shot

**A** WAVE OF NEW PRODUCTS, FROM SUPPLEMENTS TO YOGURT, IS HITTING STORE SHELVES, PROMISING TO IMPROVE A PERSON'S IMMUNE SYSTEM AND HELP WARD OFF ILLNESSES.

But what is really effective?

Before immediately buying into the hype of new products, consumers should keep in mind a few foods or nutrients that actually have benefits for the body's immune system, said Lona Sandon, assistant professor of clinical nutrition at UT Southwestern.

### Vitamins A, C and E.

These are antioxidants that work to support immune system function, studies have shown. A glass of orange juice provides plenty of vitamin C. Sweet potatoes are a good source of vitamin A, while whole grains offer vitamin E. "These are the building blocks for a strong immune system," Ms. Sandon said.



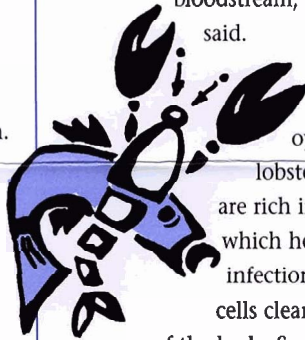
**Yogurt.** This contains probiotics, live cultures of bacteria that work to keep



disease-causing germs out of the intestinal tract. "This helps prevent germs from getting in the bloodstream," Ms. Sandon said.

### Seafood.

Fish, oysters, lobsters and crabs are rich in selenium, which helps infection-fighting cells clear viruses out of the body. Seafood also is rich in zinc. Fish, most notably salmon, is a good source of omega-3 fatty acids, which act as a blood thinner that could prevent dangerous clots because it reduces inflammation that can contribute to the buildup of plaque in arteries.



### Lean meat.

This food is a good source of both zinc and protein.



**Cranberries.** Cranberries have a high level of antioxidants which protect cells and which, in turn, help the body block urinary-tract infections and prevent gum disease and stomach ulcers.

Supplements do have their place, but it is better to eat the actual food that is the nutrient source. The nutrients contained in food have more health benefits than pulling the nutrients out and putting it into a pill, Ms. Sandon said.

In addition, Ms. Sandon recommends that people eat a well-balanced diet, get vigorous exercise daily, get plenty of sleep and wash hands often to bolster the immune system and keep from getting sick.

"This is a great way to stay healthy," she said. ❧

## Like mother, like daughter: promoting a healthy body image

**A** mother who has unhealthy eating habits and a poor body image can negatively impact her daughter's perspective on eating and weight, which can cause low self-esteem or endanger the health

of a young girl, according to Lona Sandon, assistant professor of clinical nutrition at UT Southwestern.

For instance, if a mother drinks milk and eats a healthy diet, her daughter's eating habits often will follow. If a mother obsesses about

calories, dieting and losing weight, her daughter will also.

"A mother who openly expresses dissatisfaction with her own weight and body image is putting her daughter at risk for disordered eating habits," Ms. Sandon said. ❧



**T**o promote healthy eating and body image, Ms. Sandon urges mothers to follow these tips:

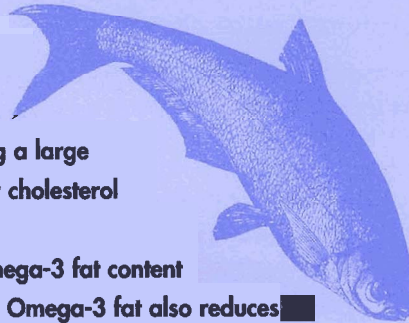
- \* Be a positive role model for your daughter by "doing" rather than "telling." Parents who eat more fruits, vegetables and whole grains have children who eat them. Parents who don't eat those foods but tell their children to do so often generate the opposite effect.
- \* Set aside time for family mealtime. Do not discuss weight at the dinner table.
- \* Exercise, together and separately.
- \* Avoid using food as a punishment or a reward.
- \* Keep negative thoughts about food, your body, and your child's body to yourself. Discuss concerns privately with your doctor or dietitian.
- \* Compliment daughters on qualities other than their appearance.

## A Question of Nutrition?.....Ask Dr. Carson

### Q: Is eating salmon good for your cholesterol?

**A:** Some people might think so, but it doesn't actually do so directly. Substitution of salmon for less heart-healthy meats can lower one's level of cholesterol in the blood. For instance, replacing a large steak or fast-food fried chicken with grilled salmon can lower your cholesterol because you've lowered the saturated or trans fat in your diet.

The real heart benefit of eating salmon comes from how the omega-3 fat content reduces inflammation that favors the buildup of plaque in arteries. Omega-3 fat also reduces the likelihood of a blood clot blocking a narrowed artery. The American Dietetic Association and the American Heart Association both recommend including fatty fish, such as salmon, mackerel and tuna, twice weekly to total 6 to 7 ounces a week.



DR. JO ANN CARSON



### Q: Which is the better choice, margarine or butter?

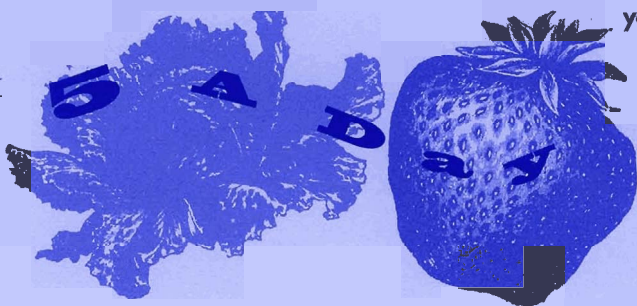
**A:** Pass if given the choice of stick margarine or butter. The best choice is a soft tub margarine or liquid spread. Another option is to do as the Mediterraneans do: Dip your bread in seasoned olive oil.

Stick margarine contains unhealthy trans fat, and butter contains unhealthy cholesterol and saturated fat. Trans fat, cholesterol and saturated fat are all unhealthy because they raise your "bad" LDL cholesterol.

Selecting a soft margarine spread is even more complex because there are so many light and whipped versions on the market. Light margarines incorporate water to reduce fat and calories. Margarine-like spreads often include some water and other ingredients that reduce the fat and calories per teaspoon. With increased concern about trans fats created when oils are hydrogenated to make a solid stick of margarine, the healthiest solution is to look for a product low in both saturated and trans fat.

### Q: How many fruits and vegetables do adults need to eat a day for good health?

**A:** About 5 cups of fruits and vegetables daily is a good goal, but fewer are allowed if you need very few calories due to age and inactivity. In the past, the "5 A Day" program urged people to eat five servings a day; a serving was 1/2 cup. Now we recommend a full cup serving of fruits and vegetables based on the benefits of the phytochemicals found in colorful fruits and vegetables. They contain vitamins A and C, folate, potassium and lots of antioxidant compounds. Antioxidants may reduce risk for cancer and heart disease. Potassium can reduce blood pressure. Vitamin A and C can protect against infection. Fruits and vegetables also fill your plate with lower calorie options, making weight control easier.



It is wisest to boost your intake with whole fruits and vegetables, rather than fruit juices that can quickly give you extra calories.

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Joining the Friends makes you part of the effort to improve the quality of life today and for the next century. Your membership will support the research of promising young scientists and ensure that excellent nutrition research continues well into the future. Your membership also entitles you to receive the *Center for Human Nutrition Newsletter*, the *Fresh News* postcard eight times a year, to attend regular meetings with other members and distinguished nutrition scientists, and to receive letters from Dr. Scott Grundy clarifying and updating current nutrition issues.

Annual membership in the Friends is a tax-deductible contribution of \$1,000 per individual or couple. Membership in the Younger Friends, which has activities oriented toward those 40 or younger, is \$250. A new category has been added to the Younger Friends for those who are 41 to 45 years of age. That fee is \$500 per year. To join the Friends of the Center for Human Nutrition, call 214-648-2344. ☎

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