

# When is fat a heart risk? Scientists re-evaluate its role in your health

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When you think about body fat, you probably imagine a pillowy, inert substance about as active as the couch potatoes who tend to accumulate it.

In fact, [fat](#) has a secret life. Recent studies have shown that it can communicate with the heart and influence the organs around it. It produces chemicals that regulate hunger and cause [heart disease](#) and diabetes. It can also be protective, expanding like a sponge to mop up excess fat so it doesn't build up in more dangerous places like the heart and liver.

"We used to think of fat as being just a dead tissue, and now we know that it actually is alive, it's breathing, it's dynamic," says Dr. Deborah Clegg, a nutritionist and researcher at the University of Texas Southwestern Medical Center.

These findings are among many that are turning the understanding of obesity on its head. Doctors are learning, for example, that it's not how much fat you have but where you store it that affects your risk of developing heart disease, diabetes and stroke. And they envision someday being able to offer customized medical treatment to regulate it.

"It may not be about weight loss but about losing the right type of fat," says Dr. James de Lemos, professor of medicine and cardiology at the University of Texas Southwestern.

His and his colleagues' findings are helping make traditional measures of obesity, such as BMI, or the body mass index, obsolete.

BMI, first developed by a Belgian mathematician in 1842, is based on one's height and weight. In 1997 the World Health Organization defined obesity as a BMI greater than 30. But BMI does not distinguish between fat and muscle mass, nor does it take into account where fat in the body is stored, which research is showing to be far more important than one's overall size.

Researchers have long known that pear-shaped people - Beyonce types with slim waists and fuller hips and thighs - have a lower than average risk of heart attack and stroke. Apple-shaped folks who store fat in their bellies have a higher-than-average risk.

New research is adding nuance to that observation.

In results presented last fall at the American Heart Association's annual meeting in Dallas, Dr. Ian Neeland, a fellow in cardiovascular medicine at Southwestern, de Lemos and their colleagues reported that not all apple-shaped individuals are alike.

An apple shape can be caused by two different kinds of fat - subcutaneous fat that is stored just beneath the skin, and [visceral fat](#), an internal layer that coats body organs. Neeland and his team followed 972 obese Dallas County, Texas, residents over eight years and found that those who store most of their fat just beneath the skin were not at increased risk for heart disease, no matter how much they weighed or how broad their waistlines.

People who stored [subcutaneous fat](#) in their hips, buttocks and thighs had a lower than average risk.

However, patients with high levels of visceral fat were much more likely to develop heart disease, including heart attacks, strokes, heart failure and an irregular heartbeat known as atrial fibrillation.

"Visceral fat is really the main thing that tracks with heart disease," de Lemos says.

Unfortunately, it's virtually impossible to measure visceral fat without an MRI machine or other high-tech scanning tools. But those who have high blood pressure, high blood sugar and high triglycerides - a measure that appears on most standard cholesterol tests - tend to have more visceral fat.

Neeland's results came from the Dallas Heart Study, through which he and his colleagues have been following more than 6,000 Dallas County residents since 2000. Their aim is to better predict who will and who will not develop life-threatening conditions like diabetes, strokes and heart attacks.

"My interest is in heterogeneity: When you look at someone who is obese, how can you tell if that person is at risk?" Neeland says.

Now that researchers know that some kinds of fat are more dangerous than others, they are looking into what determines how fat is distributed within the body.

Clegg's work has shown that estrogen may play a role. In a recent study, Clegg deprived fat cells in male and female mice of their estrogen receptors - sites where fat cells attach to estrogen. She found that the females began storing fat much the way males did: in their midsections. The altered fat cells were also much less absorbent: Instead of capturing extraneous fat from the rodents' diet and storing it near the skin, they allowed the extra calories to escape and build up inside body organs.

Dr. Aslan Turer, also at Southwestern, is examining how the heart and [fat cells](#) communicate. He and Neeland have found that a hormone secreted by the heart at times of stress, including during exercise, may reduce the amount of visceral fat in the body. The hormone is known as brain natriuretic peptide. "Fat is the primary source of energy for the heart, so it makes sense that the heart can drive reduction of [fat mass](#) by some mechanism, and this may be how it does it," Turer says.

Researchers hope their findings will yield more personalized obesity treatments within the next five to 10 years. "We'd love to be able to tell a fat cell where to go and to be expandable," says Clegg, speaking about the possibility of developing effective medications to redistribute fat. Neeland says it would be ideal for people to be able to selectively reduce abdominal and visceral fat but to keep the lower-[body fat](#) that appears to be protective.

## WHAT CAN YOU DO?

There are some proven ways to reduce visceral fat. Studies have shown that a form of gastric bypass surgery known as Roux-en-Y "preferentially decreases visceral fat, as compared with other fat layers," says Neeland. Doctors typically recommend the surgery for those with a BMI higher than 40 or for those who are moderately obese but have diabetes.

The rest of us will have to abide by the standard advice of eating a healthy diet and exercising regularly. There is no evidence that any particular diet - including the current fad, the Fast Diet, which has popularized fasting two days out of every five - leads to visceral fat loss.

But exercise has proven benefits. "Chances are the first fat you start burning is the visceral fat," says Dr. Francisco Lopez-Jimenez, director of preventive cardiology at the Mayo Clinic in Rochester, Minn. "It's the

first reserve fat that the body uses."

Dr. Carl Lavie, medical director of cardiac rehabilitation and preventive cardiology at the Ochsner Medical Center in New Orleans, says fitness may be more important than diet and weight loss in preventing [heart](#) disease. "For long-term survival," he says, "it would be much better to be fit and obese than it would to be lean and unfit."

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