

Mayo Clinic finds upper, lower body gain weight differently

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Using ice cream, candy bars and energy drinks to help volunteers gain weight, Mayo Clinic researchers have discovered the mechanisms of how body fat grows. Increased abdominal fat seems to heighten risk for metabolic disease, while fat expansion in the lower body -- as in the thighs -- seems to lower the risk. The findings, appearing in today's *Proceedings of the National Academy of Sciences (PNAS)*, help explain why.

"The cellular mechanisms are different," explains Michael Jensen, M.D., Mayo Clinic endocrinologist and lead author of the study. "The accumulation of abdominal fat happens largely by individual cells expanding in size, while with fat gain in the femoral or lower body, it's the number of fat cells that increases. So, different mechanism, different impact."

Researchers recruited 28 volunteers to the research study. They were overfed for eight weeks, consuming giant candy bars, ice cream shakes, high-calorie drinks and almost anything else they wanted to eat. On average, participants put on 2.5 kilograms (kg) or 5.5 pounds (lbs) of upper body fat and 1.5 kg or 3.3 lbs of lower body fat. Even prior to fat gain, the preadipocytes (cells with the ability to become mature fat cells) in the upper body showed an increase in RNA messages which prompt proteins to synthesize fat.

Fifteen men and 13 women participated in the study. Researchers measured body fat and fat cell size before and after the eight weeks of

overeating. Researchers say their findings challenge the concept that the number of fat cells in the body remains stable in adults. It also supports the idea that increased capacity to produce lower-body fat cells creates some form of protection to the upper body and potentially helps prevent metabolic disease which can lead to diabetes and other complications.

Provided by Mayo Clinic

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