Website address:
https://www.gesundheitsindustrie-bw.de/en/article/press-release/mri-better-indicator-bmi-when-body-fat-becomes-dangerous

MRI is a better indicator than BMI of when body fat becomes dangerous

The body mass index, or BMI for short, is one of the most commonly used measures in medicine. It is based on height and weight. However, it does not show where fat is stored or the composition of muscle mass. An international team of researchers led by Senior Physician Prof. Dr. Jakob Weiß and Senior Physician PD Dr. Matthias Jung from the Department of Radiology at the Medical Center – University of Freiburg therefore evaluated whole-body magnetic resonance imaging (MRI) scans of 66,608 individuals. The study measured abdominal fat, subcutaneous fat, skeletal muscle mass, and fat content within the muscles. The study shows that risks—such as for heart disease and diabetes—can be mapped more precisely using this method than with BMI. In addition, the team developed reference values for healthy individuals based on age, sex, and height. The study was published on May 5, 2026, in the journal Radiology.

"Many treatment decisions are still based on BMI because this value is readily available. However, it provides only an incomplete picture of actual body composition," says Weiß. "Our results show that fat distribution and muscle quality provide important additional clues about health risks."

The MRI data showed clear correlations with future health risks:

- People with a lot of abdominal fat had a significantly higher risk of developing diabetes.
- A high amount of fat within the muscles was associated with a higher risk of severe cardiovascular disease.
- Low muscle mass was associated with higher overall mortality.

These correlations remained even when known risk factors such as blood pressure or smoking were taken into account. "The MRI analysis thus provides additional insights that go beyond traditional risk factors," says Weiß.

MRI measurements could make preventive care more targeted

Of course, BMI remains a suitable tool for a rough assessment of body weight. For patients, MRI analysis could enable a more accurate assessment of their health risks in the future. "After all, two people with the same BMI can differ significantly in where fat is stored in the body and how well their muscles are maintained. Muscle quality is particularly important because stored fat is not visible from the outside," says Jung. MRI analysis makes these differences visible and compares them with reference values for healthy people. This provides a more accurate picture of an individual's health status.

AI Reveals Hidden Risk Factors

For the study, the researchers used data from the UK Biobank and the German NAKO Longitudinal Study. An automated deep learning system calculated several body composition metrics from the MRI data. The team then examined whether these measurements were associated with subsequent illnesses and deaths.

In subsequent steps, the team plans to investigate how the new parameters can be used in everyday clinical practice to better guide prevention, diagnosis, and treatment. A particular focus is on cancer patients. Here, the aim is to determine whether MRI parameters can be used to better predict treatment side effects, relapses, and survival rates.

Original title of the study:
Body Composition in the General Population: Whole-body MRI–derived Reference Curves from Over 66 000 Individuals
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Further information

- Universitätsklinikum Freiburg