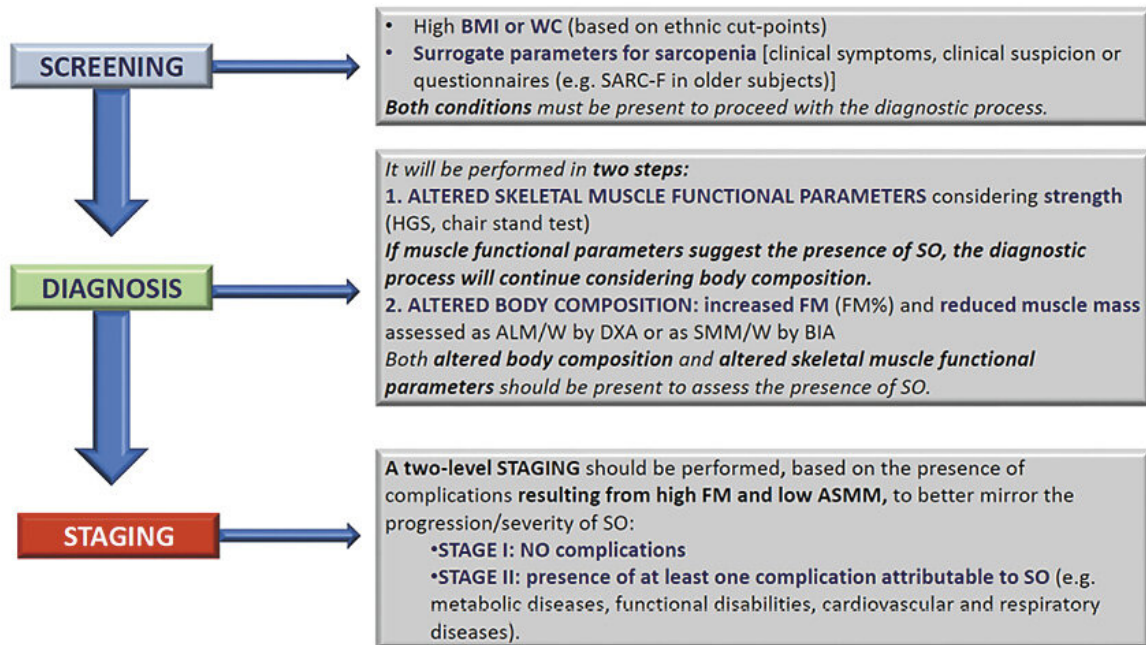


Experts warn about hidden muscle atrophy

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Diagnostic procedure for the assessment of sarcopenic obesity. ALM/W, appendicular lean mass adjusted to body weight; ASMM, absolute skeletal muscle mass; BIA, bioelectrical impedance analysis; BMI, body mass index; DXA, dual X-ray absorptiometry; FM, fat mass; HGS, handgrip strength; SMM/W, total skeletal muscle mass adjusted by weight; SO, sarcopenic obesity; WC, waist circumference; SARC-F, strength, assistance with walking, rising from a chair, climbing stairs and falls. Credit: *Clinical Nutrition* (2023). DOI: 10.1016/j.clnu.2023.02.018

It is a condition that has received little attention to date, and it mainly

affects people who are obese: due to a lack of exercise, this population group can suffer from gradual muscle atrophy, which remains hidden under the fat layer and thus undetected. Prof. Dr. Med. Stephan Bischoff from the University of Hohenheim in Stuttgart is part of an international panel of experts that defined the new clinical picture of "sarcopenic obesity" and developed criteria for diagnosis. The experts published their findings in the journals *Clinical Nutrition* and *Obesity Facts*. The next step is to develop suitable therapies.

Muscle atrophy due to lack of exercise is a disease that has so far been observed mainly in the elderly, in the chronically ill, and as a result of prolonged periods of immobility. Examples of such chronic diseases could be cancer, heart failure, or diabetes. Prolonged immobility could be caused, for example, by wearing a cast or being confined to bed for a long time.

What is new, however, is the realization that [young people](#) can also suffer from [muscle loss](#) if they are obese, explained clinical nutritionist Bischoff. "As [obesity](#) increases, first the [muscle mass](#) increases to compensate for the weight gain. After that, however, [muscle](#) mass often reaches a tipping point where it starts to decline again due to lack of exercise."

As muscle mass decreases, the risk of disease increases

The dangerous thing about it: in severely to morbidly [obese people](#), the layer of body fat hides the dangerous loss of muscle.

The consequences should not be underestimated, warned Bischoff. "Patients with muscle atrophy are significantly more susceptible to disease. Life expectancy also decreases."

This connection was also illustrated, for example, by the waves of illness during the COVID pandemic. "Because muscle atrophy in obese people also affects the respiratory muscles, they had much more severe courses of illness due to decreased respiratory capacity," said Bischoff.

A quarter of the population potentially affected

In Germany, unfortunately many people are overweight or obese. About half of the population in Germany is now overweight, he said. According to Bischoff, one quarter of the total population is so overweight that it is classified as a disease under the name obesity (see background).

At first, he said, the association between obesity and [muscle atrophy](#) was noticed due to a cluster of isolated observations. To substantiate the suspicion, two professional societies—the European Society for Clinical Nutrition and Metabolism (ESPEN) and the European Association for the Study of Obesity (EASO)—decided to clarify the issue with an [expert panel](#) convened for that purpose.

On their behalf, Bischoff and more than 30 colleagues brought together expertise from 16 countries in Europe and overseas. In a 4-stage consensus meeting, experts from different disciplines developed a clinical definition and diagnostic procedures. The panel was coordinated by Prof. Dr. Lorenzo Donini of Italy's Sapienza University in Rome.

Consensus paper recommends mix of methods for diagnosis

To diagnose what they call "sarcopenic obesity," they recommend a mix of methods. The proportions of fat and muscle mass in the body are determined and muscle function is measured.

The bio-impedance analysis can be used to determine the body composition, for example: the analyzer passes a weak current through the patient's body. The body composition can then be calculated from the electrical resistance. Alternatively, measurements from magnetic resonance imaging (MRI) could be used.

To test muscle function, there are a series of standardized tests. For example, the number of times patients could stand up and sit down in one minute or the distance they could walk in 6 minutes could be recorded.

"We speak of sarcopenic obesity when both the proportion of muscle mass is too low and muscle function is already impaired," said Bischoff. The final diagnosis would then take into account details such as age, gender, and even ethnicity.

High-protein diet a beacon of hope among therapies

How sarcopenic obesity can be treated is currently still the subject of research, emphasized Bischoff. However, the first results are already emerging.

"From obesity research, we are already familiar with some weight-reduction programs. We have been successfully applying one of these at the University of Hohenheim for around 20 years. Now we have to pay even more attention to keeping the muscle mass untouched or rebuilt as much as possible during weight loss. The most promising way to achieve this seems to be a combination of strength training and a high-protein diet."

Bischoff said he has recommended the high-protein diet for decades and uses it in his own practice: "Until now, we've recommended the high-protein diet primarily because it satisfies hunger quickly, thereby

increasing weight loss success."

There would likely be a need for adjustments in exercise therapy: "More important than endurance training seems to be lifting weights—the way bodybuilders and weightlifters do."

Surgical measures require more intensive follow-up care

Even more far-reaching, he said, are the implications of the new findings for surgical interventions in morbidly obese people that involve reducing the size of the stomach or shortening the intestine.

"In such cases, we need much more intensive follow-up care," stated Bischoff. Because proteins make you feel full very quickly, it is very difficult for patients with small stomachs to consume sufficient amounts. "That's when a feeling of fullness or nausea sets in very quickly."

The necessary exercise training is also proving to be complex. "In an initial study together with the Tübingen University Hospital, we had tried to encourage those affected to train on their own," reported Bischoff. For this purpose, the patients received a Wii console and corresponding training programs.

However, success with this approach has been limited. "It turns out that patients need a lot more active assistance, especially after surgical treatment," Bischoff stated.

More information: Gianluca Gortan Cappellari et al, Sarcopenic obesity research perspectives outlined by the sarcopenic obesity global leadership initiative (SOGLI)—Proceedings from the SOGLI consortium meeting in Rome November 2022, *Clinical Nutrition* (2023).

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