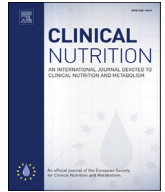




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Review

Towards a multidisciplinary approach to understand and manage obesity and related diseases[☆]

Stephan C. Bischoff^{a,*}, Yves Boirie^b, Tommy Cederholm^c, Michael Chourdakis^d, Cristina Cuerda^e, Nathalie M. Delzenne^f, Nicolaas E. Deutz^g, Denis Fouque^h, Laurence Gentonⁱ, Carmen Gil^j, Berthold Koletzko^k, Miguel Leon-Sanz^l, Raanan Shamir^m, Joelle Singer^{n,o}, Pierre Singer^{o,p}, Nanette Stroebele-Benschop^q, Anders Thorell^r, Arved Weimann^s, Rocco Barazzoni^t

^a University of Hohenheim, Department of Nutritional Medicine, Stuttgart, Germany

^b University of Clermont Auvergne, Human Nutrition Unit, Department of Clinical Nutrition, CHU Clermont-Ferrand, France

^c Uppsala University, Dept. of Public Health and Caring Sciences/Clinical Nutrition and Metabolism, Uppsala, Sweden

^d Aristotle University of Thessaloniki, Medical Nutrition, School of Medicine, Thessaloniki, Greece

^e Hospital General Universitario Gregorio Marañón, Nutrition Unit, Madrid, Spain

^f Université Catholique de Louvain, Metabolism and Nutrition Research Group, Louvain Drug Research Institute, Brussels, Belgium

^g Center for Translational Research in Aging and Longevity, Dept. Health and Kinesiology, Texas A&M University, College Station, TX 77843-4253, USA

^h Université Lyon, UCBL, Carmen, CENS, Renal Unit, Centre Hospitalier Lyon SUD, Pierre Benite, Lyon, France

ⁱ Geneva University Hospital, Clinical Nutrition, 1211 Geneva 14, Switzerland

^j Hospital Central de la Defensa Gomez Ulla, Department of Endocrinology and Nutrition, Madrid, Spain

^k Ludwig-Maximilians-Universität Munich, Dr. von Hauner Children's Hospital, Univ. of Munich Medical Centre, München, Germany

^l Complutense University Madrid, Department of Medicine & Hospital Doce de Octubre, Endocrinology and Nutrition, Madrid, Spain

^m Schneider Children's Medical Center, Sackler Faculty of Medicine, Tel-Aviv University, Israel

ⁿ Rabin Medical Center, Beilinson Hospital, Endocrine Institute, Petah Tikva, Israel

^o Sackler School of Medicine, Tel Aviv University, Israel

^p Rabin Medical Center, Beilinson Hospital, Critical Care Medicine and Institute for Nutrition Research, Petah Tikva, Israel

^q University of Hohenheim, Department of Nutritional Medicine, Division of Applied Psychology, Stuttgart, Germany

^r Karolinska Institutet, Department of Clinical Science, Danderyd Hospital & Department of Surgery, Ersta Hospital, Stockholm, Sweden

^s Hospital St. Georg Leipzig, Department of General, Visceral and Oncological Surgery, Leipzig, Germany

^t University of Trieste, Department of Medical, Surgical and Health Sciences, Trieste, Italy

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SUMMARY

Overnutrition and sedentary lifestyle result in overweight or obesity defined as abnormal or excessive fat accumulation that may impair health. According to the WHO, the worldwide prevalence of obesity nearly doubled between 1980 and 2008. In 2008, over 50% of both men and women in the WHO European Region were overweight, and approximately 23% of women and 20% of men were obese. Comprehensive diagnostic and therapeutic approaches should include nutritional treatment to favor the best metabolic and nutritional outcome, as well as to induce potential disease-specific benefits from selected nutritional regimens. Obesity is usually accompanied by an increased muscle mass. This might explain why obesity, under particular circumstances such as cancer or high age, might have protective effects, a phenomenon named the 'obesity paradox'. However, loss of muscle mass or function can also occur, which is

Abbreviations: BIA, bio-electric impedance analysis; BMI, body mass index; CBW, current body weight; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary disease; CRF, cardiorespiratory fitness; CV, cardiovascular; DXA, dual X-ray absorptiometry; EBW, excess body weight; EN, enteral nutrition; ERAS, enhanced recovery after surgery; GI, gastrointestinal; HPA, hypothalamic-pituitary-adrenal; HRQoL, health-related quality of life; IBW, ideal body weight; ICU, intensive care unit; LPS, lipopolysaccharides; MHD, mental health disorders; NAFLD, non-alcoholic fatty liver disease; OA, osteoarthritis; PN, parenteral nutrition; QoL, quality of life; RWL, relative weight loss; REE, resting energy expenditure; SCFA, short-chain fatty acids; T2DM, type 2 diabetes mellitus; WHO, World Health Organization.

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* Corresponding author. Department of Nutritional Medicine, University of Hohenheim, Fruwirthstr. 12, D-70593 Stuttgart, Germany. Fax: +49 711 45924343.

E-mail addresses: bischoff.stephan@uni-hohenheim.de (S.C. Bischoff), yves.boirie@clermont.inra.fr (Y. Boirie), tommy.cederholm@pubcare.uu.se (T. Cederholm), mhourd@auth.gr (M. Chourdakis), cuerda.cristina@gmail.com (C. Cuerda), nathalie.delzenne@uclouvain.be (N.M. Delzenne), nep.deutz@tamu.edu (N.E. Deutz), denis.fouque@chu-lyon.fr (D. Fouque), Laurence.Genton@hcuge.ch (L. Genton), carmengilm19@gmail.com (C. Gil), office.koletzko@med.lmu.de (B. Koletzko), mleon@h12o.es (M. Leon-Sanz), shamirraanan@gmail.com (R. Shamir), joelle.singer@gmail.com (J. Singer), psinger@clalit.org.il (P. Singer), N.Stroebele@uni-hohenheim.de (N. Stroebele-Benschop), anders.thorell@erstadiakoni.se (A. Thorell), arved.weimann@sanktgeorg.de (A. Weimann), barazzoni@units.it (R. Barazzoni).

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Multidisciplinary
Weight maintenance

associated with poor prognosis and termed 'sarcopenic obesity'. Therefore, treatment recommendations may need to be individualized and adapted to co-morbidities. Since obesity is a chronic systemic disease it requires a multidisciplinary approach, both at the level of prevention and therapy including weight loss and maintenance. In the present personal review and position paper, authors from different disciplines including endocrinology, gastroenterology, nephrology, pediatrics, surgery, geriatrics, intensive care medicine, psychology and psychiatry, sports medicine and rheumatology, both at the basic science and clinical level, present their view on the topic and underline the necessity to provide a multidisciplinary approach, to address this epidemic.

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1. Introduction

1.1. Definition of obesity

Recently, the ESPEN society has published a consensus on new terminology for clinical nutrition, in which obesity and related terms as well as related diagnostic procedures have been defined [1]. According to this terminology, nutrition disorders and nutrition-related conditions are divided into malnutrition/undernutrition and overnutrition resulting in overweight or obesity (Fig. 1). Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health (WHO 2000). Apart from fat accumulation, adipocyte dysfunction may occur, leading to metabolic changes enhancing the risk of chronic diseases and cancer. Classification of overweight and obesity in adults is achieved through the use of body mass index (BMI), which is a simple index of weight-for-height (Table 1).

1.2. Sarcopenic obesity

According to the new ESPEN consensus on terminology [1] sarcopenia is a syndrome characterized by the progressive and generalized loss of skeletal muscle mass, strength and function

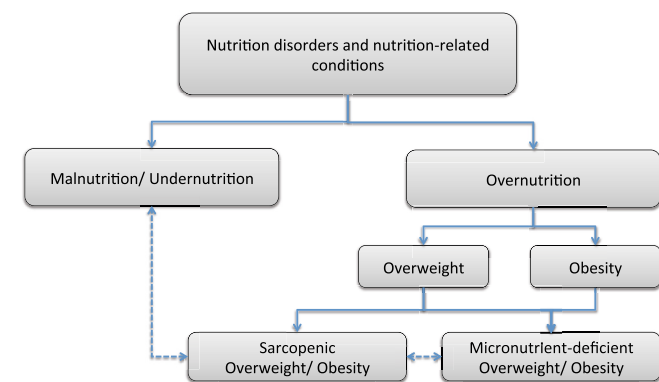


Fig. 1. Nomenclature of overnutrition, overweight and obesity. For explanations see text.

Table 1
Classification of overnutrition.

Classification	Subclassification	Criteria
Overweight		BMI 25–29.9 kg/m ²
Obesity		BMI ≥30 kg/m ²
	Obesity grade I	BMI 30–34.9 kg/m ²
	Obesity grade II	BMI 35–39.9 kg/m ²
	Obesity grade III	BMI ≥40 kg/m ²

Abbreviation: BMI, body mass index, defined as a person's weight in kilograms divided by the square of their height in meters.

(performance) with a consequent risk of adverse outcomes [2–4]. Whilst often a phenomenon of the ageing processes (primary sarcopenia) it may also result from pathogenic mechanisms (secondary sarcopenia) that are disease-related, physical activity-related (e.g. disuse) or nutrition-related (e.g. protein deficiency). Diagnostic criteria for sarcopenia have not been firmly established to date. Sarcopenic obesity is defined as obesity in combination with sarcopenia that occurs for example in older individuals, in those with type 2 diabetes mellitus (T2DM) or chronic obstructive pulmonary disease (COPD), and in weight-losing obese patients with malignant disorders. Mechanisms include inflammation and/or inactivity induced muscle catabolism in obese patients [5,6]. The condition can occur virtually at all ages.

1.3. Obesity as a chronic systemic disease

Obesity is a chronic systemic disease requiring a multidisciplinary approach (Fig. 2). This fact is not clearly pointed out in the current definitions of obesity. Data indicate that obesity is hardly reversible spontaneously and is associated with increased mortality [7,8]. Despite some genetic and epigenetic influences, obesity is an acquired disease that depends on lifestyle factors such as over-eating and low physical activity [9]. This makes – at all ages – obesity prevention as well as obesity therapy a realistic albeit difficult option. There is no critical time for the development of obesity, and previous weight history is not consistently a dominant factor in determining subsequent weight gain [10].

Obesity affects almost every organ system of the body including the endocrine, gastrointestinal (GI), cardiovascular (CV), and central nervous systems. Obesity challenges not only endocrinologists, gastroenterologists, nephrologists and cardiologists, but also pediatricians and geriatricists, surgeons and intensivists, orthopedists

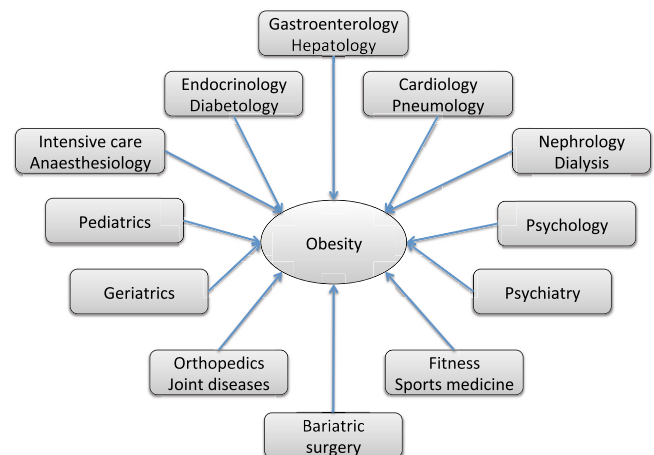


Fig. 2. Obesity is a chronic systemic disease requiring a multidisciplinary approach. For explanations see text.

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