In the developed world two parallel trends exist: an increasing percentage of the population is older and obese. In addition, debilitating illnesses such as cardiovascular disease and diabetes are common to both obesity and aging. Frailty and sarcopenia may represent the advanced stages of progressive age-related body composition changes. Weakness falls, functional limitations, immobility, and osteoporotic fractures may be linked to declines in musculoskeletal mass. Has been reported that loss of skeletal muscle mass occurs with advancing age in elderly men and women, even in independently living healthy subjects and that men lose significantly more leg skeletal muscle mass than women, Gallagher et al. (2000). Furthermore, skeletal muscle mass loss in men is masked by weight stability, resulting from a corresponding increase in total body fat mass. Progression of sarcopenia, particularly in men, may therefore be clinically silent and comparable to the loss of bone mineral density in osteoporosis (Gallagher et al. 2000).

Ageing is associated with changes in body composition, including an increase and redistribution of adipose tissue and a decrease in skeletal muscle and bone mass, beginning as early as the fourth decade of life. Aging is associated with a decline in bone mass, skeletal muscle mass, strength, and physical work capacity. Women are more likely to suffer from these physical changes than men. These changes have significant implications for the health and functioning of the individual because of their associations with chronic disease expression and severity, as well as geriatric syndromes such as mobility impairment, falls, frailty and functional decline. In a longitudinal a sex difference was found in relation between sarcopenia and disability, with sarcopenia a risk factor in women but not men (Janssen I. 2006). The reasons for this sex difference are unclear and are inconsistent with cross-sectional observations. The cross-sectional analyses in Janssen’s study indicate that muscle size is more strongly related to functional performance and disability in older men than in older women. Nonetheless, the observation that sarcopenia had a greater effect on disability in women makes sense from an ecologic perspective. That is, older women have a smaller muscle mass than older men who are consistent with the higher rate of disability in older women.

In addition to the loss of lean mass, other important changes in body composition occur with sex hormone deficiency in women. Adipose tissue distribution changes toward central or abdominal obesity, these changes are related to an increased risk of coronary artery disease and osteoporosis. Sowers et al. Follow body composition in women over six years at mid-life and identified that the 6-year increase in weight of women at the mid-life was associated with both a substantially increased fat mass and a smaller, nonetheless real, loss of skeletal muscle mass. These body composition changes were explained, not only with the increasing age associated with the passage of time, but also with ovarian aging including progressively higher FSH concentrations and occurrence of the last menstrual period. We have taken into account that adipose tissue became an acknowledged endocrine organ rather than just a passive reservoir for energy storage with the identification that adipocytes were sites of sex steroid metabolism and leptin production. Thus, the increases in fat mass and its distribution to the waist around the menopause represent compelling risk factors for heart disease. It is valuable to consider not only the change in weight with the menopause, but also additional measures of body composition. (Sowers MF 2006). Therefore, understanding the preventive and therapeutic options for optimizing body composition in old age is central to the care of patients in mid-life and beyond. Pharmacological interventions are currently available for maintaining or improving bone mass, and much current interest is focused on anabolic agents that will preserve or restore muscle mass, as well as those that can potentially limit adipose tissue deposition.

An accurate measure of Body Cell Mass would prove extremely useful for establishing an individual's state of health or disease over time, possibly assisting with the prevention of sarcopenia. De Lorenzo et al (2004) evaluated BCM in a cohort of Italian men in order to assess differences in body composition with age. The results confirm that there is a major decrease in BCM with age, and in a weight stable subject, the BCM may be decreased, which may lead to a reduced functional capacity (De Lorenco 2004).

Body Mass Index does not discriminates body fat from fat-free mass neither detecting changes in these parameters with physical activity and aging. Kyle et al. (2004) evaluated
differences in body mass index, BFMI, and FFMI in physically active and sedentary subjects younger and older than 60 y and determined the association between physical activity, age, and body composition parameters in a healthy white population between ages 18 and 98 years. Fluctuations in body weight alone cannot be adequately interpreted unless the quantitative variations of the components (fat free mass [FFM], fat mass [FM], and total body water [TBW]) are taken into account, because each component varies independently. Information on body composition on elderly can be important since body composition is an indicator of nutritional status and provides information on acute water homeostasis. There is sufficient evidence currently to suggest that a substantial portion of what have been considered ‘age-related’ changes in skeletal muscle, fat and bone are in fact related either to excess energy consumption, decreased energy expenditure in physical activity, or both factors in combination. In addition, selective underconsumption of certain macro- or micronutrients contributes to losses of skeletal muscle and bone mass. However, the rate of sarcopenia and the severity of its sequelae vary greatly according to health status, physical activity, and possibly diet.