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# THE IMPACT OF HIGH SKELETAL MUSCLE MASS AND DENSITY ON TREATMENT TOXICITIES

## Wave 3: Link to Michael Sawyer webinar Oslo 2017

Nutricia presents the 3rd and last part of a 3 series of discussions around the importance of medical nutrition as a part of supportive care in cancer. The previous articles have focused on the impact of weight loss and loss of muscle mass on survival. This last article focuses on the impact of high skeletal muscle mass and density on treatment toxicities.

## Early initiation of medical nutrition for cancer patients can improve treatment and improve life expectancy



MD, PhD Michael Sawyer elaborates over this issue in a talk given at Nutricia evening meeting The Netherlands 2016.

It is well established both from research and clinical experience that patients with cancer lose weight. The weight loss is not only loss of fat mass but loss of lean mass as well. Chemotherapy distributes over the lean mass and when this is reduced in muscle wasting during the treatment journey, the patient may experience dose limiting toxicities<sup>1</sup>.

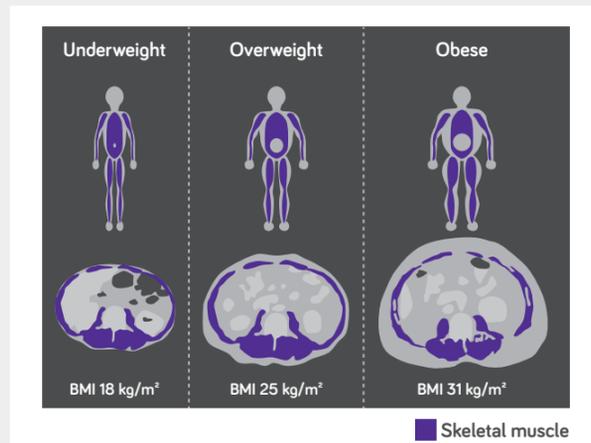


Illustration of three male patients with different BMI and similar amount of muscle cross-sectional area. Adapted from Prado CM et al, 2016.

<https://www.nutriciacongresses.com/aoe/cancer-care/>

Listen to Professor Michael Sawyer talk about how skeletal muscle mass and density affects treatment toxicities and outcome in cancer patients.



## Dose limiting toxicity in patients with low muscle mass

Since chemotherapy dosage is assessed based on height and weight (Body surface area), individuals with the same BMI but different muscle mass consequently receive the exact same amount of chemotherapy drug. The large individual variability in muscle mass is often not accounted for. As the pharmacokinetics occur in the lean tissue compartment, a person with low muscle mass but high BMI will receive a large amount of drug for a small lean tissue compartment. This person's risk for developing dose limiting toxicity increases, which can lead to treatment

discontinuation, hospitalisation or in worst case even death<sup>1</sup>. Likewise a lean person with normal BMI but high muscle mass is likely to tolerate the treatment better due to better pharmacokinetics. Several studies in cancer patients have found an association between low muscle mass and shorter survival measured by using CT imaging. Most cancer patients have a CT taken for diagnostic purposes but muscle mass is rarely calculated in clinical use. Recently bio impedance has been suggested to be a good measure too<sup>2</sup>.

## Improved survival with early initiation of medical nutrition

Studies find higher compliance to planned radiotherapy treatment after implementation of early nutritional support<sup>3,4</sup>.

Nutritional intervention is associated with longer survival in cancer patients. A study looking at Esophageal cancer patients at risk of malnutrition treated with radio-chemotherapy have improved survival when nutritional intervention is initiated at diagnosis. However, the same

association is not found when medical nutrition is initiated later in the treatment journey thus emphasizing the importance of early initiation<sup>5</sup>. Furthermore in an analysis of pancreatic cancer patients, weight gain > 2 % is associated with longer survival. Looking at time of nutritional support, the difference in prognosis is only observed when nutritional intervention occurs within 3 months from diagnosis<sup>6</sup>.



## ESPEN – Call to action

Screen all patients with cancer for nutritional risk early in their course of care, regardless of BMI and weight and initiate medical nutrition in all patients at risk<sup>7</sup>.



**Recommended guideline for energy:**  
25-30 kcal / kg / day  
**Recommended guideline for protein:**  
1-1,5 g / kg / day

### References

1. Prado CM et al. Proceedings of the Nutrition Society (2016), 75, 188-198
2. Raeder H et al. Clin Nutr ESPEN. 2018 Oct;27:24-31
3. Odelliet al. Clinical Oncology 2005; 7:639-645
4. Paccagnella et al. Support Care Cancer 2010;18:837-845
5. Cox S et al. British Journal of Cancer (2016) 115, 172-177
6. Trestini I et al. European Journal of Clinical Nutrition (2018) 72:772-779
7. Arends J et al. ESPEN Guidelines on nutrition in cancer patients. Clin Nutr 2016