Clinical Nutrition Highlights

eNewsLetter

Nestlé HealthScience

Resources for nutritional management of patients with COVID-19

INTRODUCTION

Nutritional status assessment is even more crucial nowadays given the delicate status of older patients with COVID-19[1].

Sarcopenia, defined as the loss of muscle mass and strength leading to poor function[2], is prevalent in up to 15% of apparently healthy older adults, up to 80% of acutely hospitalized older patients, and up to 70% of older post-acute rehabilitation inpatients[3]. **Closely related to malnutrition[4], sarcopenia may adversely affect respiratory function, which is already acutely compromised in COVID-19 patients[1].**

Besides, **COVID-19 is constraining many people to a sedentary lifestyle,** with serious consequences especially in older frail adults affected by this condition[5].

Early nutritional support should be guaranteed for patients infected by COVID-19 **to improve several malnutrition-related adverse outcomes**, including morbidity, mortality, immune dysfunction, hospital readmission, length of stay and healthcare costs[1].

REFERENCES

1. Azzolino D, Saporiti E, Proietti M, Cesari M. Nutritional Considerations in Frail Older Patients with COVID-19. J Nutr Health Aging 2020;24(7):696-8.12. **2.** Cruz-Jentoft AJ, Landi F. Sarcopenia. Clin Med. 2014 Jan 4;14(2):183–6. **3.** Sciacqua A, Pujia R, Arturi F, Hribal ML, Montalcini T. COVID-19 and elderly: beyond the respiratory drama. Intern Emerg Med 2020;15(5):907-9. **4.** Cederholm T, Jensen GL, Correia MITD, Gonzalez MC, Fukushima R, Higashiguchi T, et al. GLIM criteria for the diagnosis of malnutrition - A consensus report from the global clinical nutrition community. Clin Nutr. 2019;38(1):1–9. **5.** Moro T, Paoli A. When COVID-19 affects muscle: effects of quarantine in older adults. Eur J Transl Myol 2020;30(2):9069.

AIM

This issue offers **some of the most relevant publications** on **COVID-19 and sarcopenia.**

RELEVANT PUBLICATIONS ON COVID-19 AND SARCOPENIA

NUTRITIONAL CONSIDERATIONS IN FRAIL OLDER PATIENTS WITH COVID-19

Azzolino D, Saporiti E, Proietti M, Cesari M.

J Nutr Health Aging 2020;24(7):696-8. doi: 10.1007/s12603-020-1400-x.

https://pubmed.ncbi.nlm.nih.gov/32744563/

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WHEN COVID-19 AFFECTS MUSCLE: EFFECTS OF QUARANTINE IN OLDER ADULTS

Moro T, Paoli A.

Eur J Transl Myol 2020;30(2):9069. doi: 10.4081/ejtm.2019.9069.

https://pubmed.ncbi.nlm.nih.gov/32782767/

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CLINICAL SIGNIFICANCE OF NUTRITIONAL RISK SCREENING FOR OLDER ADULT PATIENTS WITH COVID-19

Liu G, Zhang S, Mao Z, Wang W, Hu H.

Eur J Clin Nutr 2020;74(6):876-83. doi: 10.1038/s41430-020-0659-7.

https://pubmed.ncbi.nlm.nih.gov/32404899/

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COVID-19 AND ELDERLY: BEYOND THE RESPIRATORY DRAMA

Sciacqua A, Pujia R, Arturi F, Hribal ML, Montalcini T.

Intern Emerg Med 2020;15(5):907-9. doi: 10.1007/s11739-020-02424-x.

https://pubmed.ncbi.nlm.nih.gov/32621268/

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EARLY NUTRITIONAL SUPPLEMENTATION IN NON-CRITICALLY ILL PATIENTS HOSPITALIZED FOR THE 2019 NOVEL CORONAVIRUS DISEASE (COVID-19): RATIONALE AND FEASIBILITY OF A SHARE PRAGMATIC PROTOCOL

Caccialanza R, Laviano A, Lobascio F, Montagna E, Bruno R, Ludovisi S, et al.

Nutrition 2020;74:110835. doi: 10.1016/j.nut.2020.110835.

https://pubmed.ncbi.nlm.nih.gov/32280058/

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PREVENTING FRAILTY PROGRESSION DURING THE COVID-19 PANDEMIC

Boreskie KF, Hay JL, Duhamel TA.

J Frailty Aging 2020;9(3):130-31. doi: 10.14283/jfa.2020.29.

https://pubmed.ncbi.nlm.nih.gov/32588024/

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NUTRITIONAL CONSIDERATIONS IN FRAIL OLDER PATIENTS WITH COVID-19

Azzolino D, Saporiti E, Proietti M, Cesari M.

J Nutr Health Aging 2020;24(7):696-8.

Sarcopenia is one of the most prominent conditions in older people. It is defined as the loss of muscle mass and strength leading to poor function. Sarcopenia is closely related to malnutrition and has been indicated as one of its clinical manifestations. Interestingly, it has recently been proposed as a whole-body process not merely limited to lower limbs, but also affecting muscles dedicated to breathing and swallowing. **Sarcopenia may concur at adversely affecting respiratory function, which is already acutely compromised in COVID-19 patients.**

Depression, loneliness, and reduced availability of food inevitably lead to changes in the quality and quantity of food in the older persons diet.

Malnutrition compromises the immune response and further increases the risk of infections, with longer hospital stays and convalescence periods and can easily predispose to the onset of poor clinical outcomes in COVID-19 patients.

Screening for malnutrition should be conducted as a part of routine clinical care, especially upon hospital admission and whenever there is a major change in the individual's health status.

In the presence of highly catabolic conditions (severe forms of COVID-19) 2.0 g/kg of body weight/d could be recommended.

Energy intake is also crucial. If caloric provision is not adequate to meet the demand, body fat and muscles are catabolized to provide energy.

With regards nutritional interventions, older adults need more proteins because of a declined anabolic response and an increased catabolism. The amount of energy and proteins should be individually adapted according to the patient's nutritional status, physical activity levels prior to the illness, clinical conditions, and preferences.

Considering that older people frequently fail to ingest a significant amount of proteins in a single meal, **A SUPPLEMENTATION STRATEGY OFTEN NEEDS TO BE CONSIDERED**. Supplementation with essential amino acids may overcome anabolic resistance since they are the primary stimulus for protein synthesis.

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WHEN COVID-19 AFFECTS MUSCLE: EFFECTS OF QUARANTINE IN OLDER ADULTS

Moro T, Paoli A.

Eur J Transl Myol 2020;30(2):9069.

Quarantine due to the COVID-19 pandemic has led to physical inactivity. A sedentary lifestyle is associated with different negative health outcomes, such as cardiovascular disease, musculoskeletal disorders, cognitive decline, and an increase of overall mortality. According to different models of physical inactivity, **it is necessary to implement physical exercise (such as walking, low load resistance or exercises in bed) during periods of disuse to protect muscle mass and function from catabolic crisis**. A combination of intense resistance training and nutrition are necessary to overcome any loss in skeletal muscle due to disuse.

A short-term (14 days) reduction of physical activity (i.e. from 10,000 to 1,500 steps/day) can impact on insulin sensitivity and cardiorespiratory fitness, increase visceral fat, and contribute to the development of dyslipidemia in healthy young adults. Fourteen days of reduced step activity were sufficient to promote low grade inflammation, reduce insulin sensitivity by ~43% and postprandial rates of protein synthesis (MPS) by ~26% in healthy older adults, leading to a ~4% loss of leg lean mass.

MUSCLE MASS LOSS DURING PERIODS OF DISUSE

Rapid loss of muscle mass during periods of disuse: explained by a decrease in protein synthesis and increases in protein degradation rates.

Inflammatory cytokines may play a critical role in protein wasting. TNF-a, a pro-inflammatory cytokine, activates the NF-kB pathway inducing protein degradation.

As a consequence, older adults develop a **resistance to any anabolic stimuli** (exercise, nutrition) which promotes **muscle atrophy.**

The post-inactivity phase will also be a cause of concern for the elderly. It seems that older adults are not able to properly recuperate muscle mass and strength after a short-term period of disuse, even when more intense training protocols are employed. Moreover, **supplementation with high quality protein (such as 1.6 g/kg/day of whey protein) in combination with physical exercise may help to stimulate MPS and improve muscle recovery in older adults**.

Once a person has returned to their usual levels of physical activity, **THE COMBINATION OF RESISTANCE EXERCISE AND NUTRITIONAL STIMULI** (appropriate energy balance and high quality protein intake) seems to be **THE MOST EFFECTIVE STRATEGY FOR COUNTERBALANCING LOSSES IN SKELETAL MUSCLE** due to disuse.

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CLINICAL SIGNIFICANCE OF NUTRITIONAL RISK SCREENING FOR OLDER ADULT PATIENTS WITH COVID-19

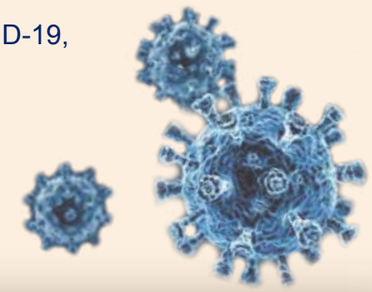
Liu G, Zhang S, Mao Z, Wang W, Hu H.

Eur J Clin Nutr 2020;74(6):876-83.

Nutrition Risk Screening 2002 (NRS 2002), Malnutrition Universal Screening Tool (MUST), Mini Nutrition Assessment Short Form (MNA-SF), and Nutrition Risk Index (NRI) are currently commonly used clinical nutrition screening methods. To date, whether malnourished patients with COVID-19 have poor clinical results or not has not been reported.

The aim of this study **was to assess the nutritional risks among older patients (> 65 years) with COVID-19 and their associated clinical outcomes using four nutritional risk screening (NRS) tools:** NRS 2002, MUST, MNA-SF, and NRI (following adjustments for confounding factors in multivariate regression analysis).

A total of 141 patients with COVID-19 (46 common COVID-19, 73 severe COVID-19, and 22 extremely severe COVID-19) were enrolled in the study. NRS 2002 identified 85.8% of patients as being at risk, with 41.1% being identified by MUST, 77.3% by MNA-SF, and 71.6% by NRI.



PATIENTS IN THE NUTRITIONAL RISK GROUP
(by using MNA-SF, NRS 2002, and NRI) had a significantly…

- LONGER LENGTH OF STAY
- POOR APPETITE
- GREATER DISEASE SEVERITY
- GREATER WEIGHT GAIN

Malnutrition interacted with infections in a vicious cycle whereby it not only increased the risk and severity of infections but could also result in infection.

The MNA-SF, NRS 2002, and NRI are useful and practical tools with respect to screening for patients with COVID-19 who are at nutritional risk, as well as needing additional nutritional intervention.

The results of the present study show that **PATIENTS WITH COVID-19 WHO WERE CLASSIFIED AS BEING AT NUTRITIONAL RISK HAD SIGNIFICANTLY POORER CLINICAL OUTCOMES** than those classified as normal following assessments by MNA-SF, NRS 2002, and NRI.

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COVID-19 AND ELDERLY: BEYOND THE RESPIRATORY DRAMA

Sciacqua A, Pujia R, Arturi F, Hribal ML, Montalcini T.

Intern Emerg Med 2020;15(5):907-9.

Although severe respiratory disease is the main clinical manifestation of COVID-19 infection, **other important factors may explain the high mortality rate**. It has been reported that **many elderly patients experience a loss of muscle mass and then weight loss**, the latter often being stable due to the fat mass increase. When loss of muscle mass is associated with reduced muscle strength, an individual is then affected by **sarcopenia. This clinical condition is the most prevalent syndrome in older medical inpatients.**

Sarcopenia is prevalent in up to 15% of apparently healthy older adults, up to 80% of acutely hospitalized older patients, and up to 70% of older post-acute rehabilitation inpatients.

FACTORS ASSOCIATED WITH SARCOPENIA

- CARDIO-VASCULAR DISEASE
- RESPIRATORY DISEASE
- COGNITIVE IMPAIRMENT
- GREATER CV AND ALL-CAUSE MORTALITY

Furthermore, **individuals with sarcopenic obesity are at a higher risk of all-cause mortality**. In this respect, numerous sources of evidence suggest that obesity is independently associated with a high risk of patients developing severe symptoms and complications of COVID-19.

To date, **three elements have been found to be essential in the dietary treatment of sarcopenia: proteins, vitamin D, and antioxidants.** Individually tailored nutritional advice should be given at an early stage to help prevent a rapid decline in clinical conditions:

- Elderly individuals require 1.4–2 g/Kg/day of protein. Branched chain amino acids and leucine play an important role in muscle protein synthesis, thanks to their high digestibility.
- Micronutrient intake, especially of vitamin D, could be adjusted in line with an individual's clinical and biochemical profile.
- Finally, **oral nutritional supplements can be beneficial when a normal balanced diet cannot guarantee an adequate amounts of energy and nutrients.**

In today's complex clinical scenario, **THE ASSESSMENT OF NUTRITIONAL STATUS DURING HOSPITALIZATION** (including body composition) **HELPS TO PREDICT THE RISK OF DEVELOPING COMPLICATIONS AND MORTALITY** and to provide the most appropriate nutritional treatment to restore a good nutritional status.

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EARLY NUTRITIONAL SUPPLEMENTATION IN NON-CRITICALLY ILL PATIENTS HOSPITALIZED FOR THE 2019 NOVEL CORONAVIRUS DISEASE (COVID-19): RATIONALE AND FEASIBILITY OF A SHARED PRAGMATIC PROTOCOL

Caccialanza R, Laviano A, Lobascio F, Montagna E, Bruno R, Ludovisi S, et al.

Nutrition 2020;74:110835.

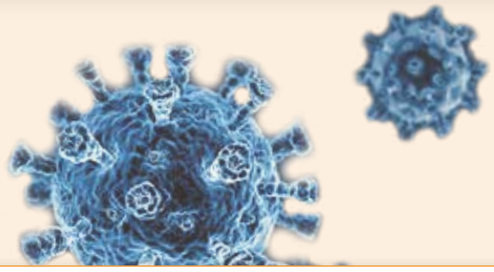
Most patients with COVID-19 present at admission with severe inflammation and anorexia leading to a drastic reduction of food intake, and a substantial percentage of them develop respiratory failure requiring non-invasive ventilation or even continuous positive airway pressure.

Considering the deleterious consequences of malnutrition on patients with COVID-19, the aim of this article is **to present a pragmatic protocol for early nutritional supplementation of non-critically ill patients hospitalized for COVID-19 disease**.

PROTOCOL

- High-calorie dense diets in a variety of different consistencies with highly digestible foods and snacks are available for all patients.
- Oral supplementation of whey proteins as well as intravenous infusion of multivitamin, multimineral trace element solutions are implemented at admission.
- Where there is a presence of 25-hydroxyvitamin D deficit, cholecalciferol is promptly administered.
- If nutritional risk is detected, two to three bottles of high protein and high calorie oral nutritional supplements (ONS) are provided.
- If <2 bottles/d of ONS are consumed for 2 consecutive days and/or respiratory conditions are worsening, supplemental/total parenteral nutrition is prescribed.

Implementing prompt and appropriate nutritional care in COVID-19 disease management is a difficult challenge owing to the current dramatic emergency circumstances. However, **all efforts should be made to try to guarantee adequate nutritional support to hospitalized patients**.



NUTRITIONAL SUPPORT MAY BE POTENTIALLY BENEFICIAL TO CLINICAL OUTCOMES and effective in reducing or preventing the deleterious consequences of malnutrition in the COVID-19 patient population.

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PREVENTING FRAILTY PROGRESSION DURING THE COVID-19 PANDEMIC

Boreskie KF, Hay JL, Duhamel TA.

J Frailty Aging 2020;9(3):130-1.

During the COVID-19 pandemic, many at-risk adults will face disproportionate social isolation, depression, malnutrition, reduced access to care, decreased physical activity, and increased sedentary time due to infection prevention measures. **Even frail adults who do not contract COVID-19 will experience a reduced quality of life, accelerated frailty progression and worse clinical outcomes**.

Malnutrition can lead to loss of lean muscle mass and muscle function with aging.
Maintaining adequate nutrition is vital in order to prevent malnutrition, a known risk factor associated with frailty. For example, there are evidence-based recommendations for:

OPTIMAL DIETARY PROTEIN INTAKE IN OLDER PEOPLE

- Recommendation that frail older adults consume **at least 1.2-1.5 grams of protein per kg of body weight per day**, as it can help to preserve muscle mass and physical function.

EXERCISE RECOMMENDATIONS FOR PRE-FRAIL AND FRAIL OLDER ADULTS

- Multi-component exercise with an emphasis on **resistance training supplemented by aerobic exercise** with balance and flexibility work.
- International physical activity guidelines recommend trying to achieve **150 minutes of moderate-vigorous aerobic physical activity with strength training on at least 2 days per week**.

STRATEGIES TO SUPPORT ADEQUATE NUTRITION are a potentially modifiable factor that can **SUPPORT HEALTH IN ADULTS WITH VULNERABILITY DUE TO FRAILTY.**

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