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# ESPEN Expert Statements 2020

**Summary created by Fresenius Kabi from:**

ESPEN Expert Statements and Practical Guidance  
for Nutritional Management of Individuals with  
SARS-CoV-2 infection<sup>1</sup>

ESPEN = European Society of Clinical Nutrition and Metabolism



# COVID-19 and Malnutrition



COVID-19 predominantly involves the respiratory tract, but it may also lead to multi-organ failure and be fatal.<sup>2-6</sup> Acute respiratory complications that are reported to require prolonged intensive care stays are a major cause of morbidity and mortality in COVID-19 patients.<sup>2-6</sup> Malnutrition, with loss of skeletal muscle mass and function, is a well-documented result of prolonged ICU stay, which can lead to poor quality of life, disability and morbidities post ICU discharge.<sup>7</sup> ESPEN advise prevention, diagnosis and treatment of malnutrition should be routinely included in the management of COVID-19 patients.<sup>1</sup>

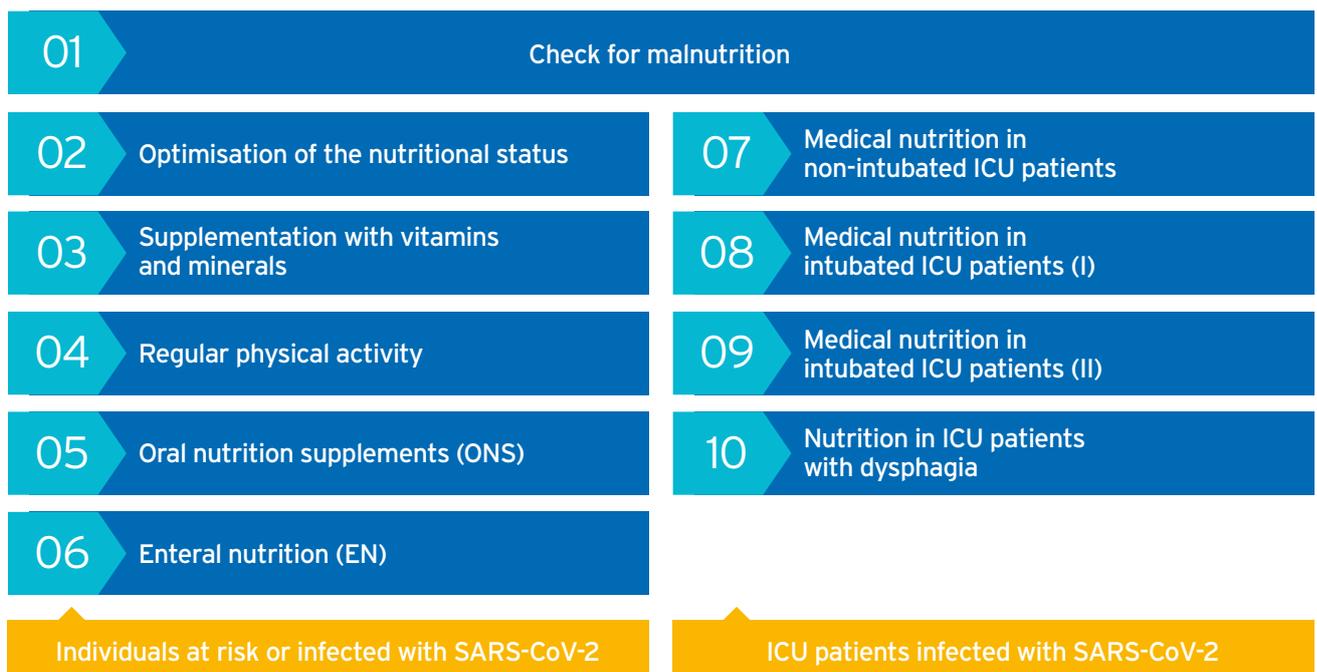
ESPEN have produced expert statements and practical guidance on the nutritional management of ICU, polymorbid and older COVID-19 patients. These are based on current ESPEN guidelines and further expert advice as there are no dedicated studies on nutritional management in patients with COVID-19 at present.<sup>1</sup>

This document is a summary, produced by Fresenius Kabi, of the main points made in the guide; the full article is referenced below -



Barazzoni R et al., ESPEN expert statements and practical guidance for nutritional management of individuals with SARS-CoV-2 infection, *Clinical Nutrition*, <https://doi.org/10.1016/j.clnu.2020.03.022>

## Nutritional Management in Individuals at Risk for Severe COVID-19, in Subjects Suffering from COVID-19, and in COVID-19 ICU Patients requiring Ventilation<sup>1</sup>



Adapted from reference 1.

# Summary of the Ten Expert Statements

## Individuals at risk or infected with SARS-CoV-2

### 01 Check for malnutrition

Patients at risk for worst outcomes and higher mortality following infection with SARS-CoV-2, namely older adults and polymorbid individuals, should be checked using the MUST criteria or, for hospitalised patients, the NRS-2002 criteria.

MUST = Malnutrition Universal Screening Tool  
NRS = Nutritional Risk Screening

ESPEN state the identification of malnutrition should be an early step in all patients, including persons with obesity. Preserving nutritional status and preventing or treating malnutrition has the potential to reduce complications and negative outcomes in patients at nutritional risk.<sup>1</sup>

### 02 Optimisation of the nutritional status

Subjects with malnutrition should undergo diet counselling from an experienced professional.

ESPEN highlight that retrospective analysis of data available on the 1918 influenza pandemic showed malnutrition and famine were associated with high disease severity and mortality.<sup>18</sup> Conversely, it is mentioned that overnutrition potentially could promote severity of disease and that obesity increases one's risk of being hospitalised with, and dying from, an influenza virus infection.<sup>18</sup>

## Energy Needs:

It is recommended that when indirect calorimetry isn't available or appropriate, the following weight based formulae may be used:<sup>1</sup>

**Note:** ESPEN (2020) have recommended these weight based formulae for COVID-19 patients from other ESPEN guidelines for different patient populations - see below:

Calories (kcal per kg body weight per day)	ESPEN guideline population
27 kcal	Polymorbid patients aged >65 years ESPEN guidelines on nutritional support for polymorbid internal medicine patients 2018 - recommendation 4.2. <sup>9</sup>
30 kcal* *This value should be slowly and cautiously achieved due to high refeeding risk in this population. <sup>1</sup>	Severely underweight polymorbid patients ESPEN guidelines on nutritional support for polymorbid internal medicine patients 2018 - recommendation 4.3. <sup>9</sup>
30 kcal* *This value should be individually adjusted with regard to nutritional status, physical activity level, disease status and tolerance. <sup>10</sup>	Guiding value for energy intake in older persons ESPEN guideline on clinical nutrition and hydration in geriatrics 2019 - recommendation 1. <sup>10</sup>

## Protein Needs:

Protein (grams per kg body weight per day)	ESPEN guideline population
1g* *This value should be individually adjusted with regard to nutritional status, physical activity level, disease status and tolerance. <sup>10</sup>	Older persons ESPEN guideline on clinical nutrition and hydration in geriatrics 2019 - recommendation 2. <sup>10</sup>
≥ 1g	Polymorbid medical inpatients ESPEN guidelines on nutritional support for polymorbid internal medicine patients 2018 - recommendation 5.1. <sup>9</sup>

**Fat to Carbohydrate Needs** - Consider an energy (kcal) ratio from fat and carbohydrates to be between 30:70 (subjects with no respiratory deficiency) to 50:50 (ventilated patients) percent.<sup>1</sup>

### 03 Supplementation with vitamins and minerals

Subjects with malnutrition should ensure supplementation with vitamin A, vitamin D and other micronutrients.

Generally, low levels of intakes of micronutrients have been associated with adverse clinical outcomes during viral infections, such as HIV (human immunodeficiency virus).<sup>11</sup> It has been proposed that vitamins A, B, C, D, and also omega-3 polyunsaturated fatty acids, selenium, zinc, and iron should be considered in the assessment of micronutrients in COVID-19 patients.<sup>12</sup> ESPEN acknowledge that while it is important to prevent and treat micronutrient deficiencies, there is no established evidence on routine supplementation of vitamins and trace elements in preventing or improving clinical outcomes in COVID-19 patients. Therefore, they suggest that a provision of daily allowances of vitamins and trace elements are taken by malnourished patients at risk of, or with, COVID-19 to maximise anti-infection nutritional defence.<sup>1</sup>

### 04 Regular physical activity

Patients in quarantine should continue regular physical activity whilst taking precautions.

In a recent paper Chen et al. conclude: "...there is a strong health rationale for continuing physical activity in the home to stay healthy and maintain immune system function in the current precarious environment."<sup>13</sup> ESPEN recommend exercise every day for >30 minutes or every second day for >1 hour to maintain fitness, mental health, muscle mass, and thus energy expenditure and body composition.<sup>1</sup>

### 05 Oral nutrition supplements (ONS)

ONS should be used whenever possible to meet patients' needs, when dietary counselling and food fortification are not sufficient to increase dietary intake and reach nutritional goals.

ESPEN recommend that ONS should provide at least 400 kcal/day including 30g or more of protein/day and should be continued for at least one month. Efficacy and expected benefit of ONS should be assessed once a month. Nutritional treatment should start early during hospitalisation (within 24 - 48 hours). Note, with older and polymorbid patients, nutritional treatment and targets should be met gradually to prevent refeeding syndrome. ONS provide energy-dense alternatives to regular meals and may be specifically enriched to meet targets in terms of protein as well as micronutrients (vitamins and trace elements) whose daily estimated requirements should be regularly provided.<sup>1</sup>

## 06 Enteral nutrition (EN)

In patients, whose nutritional requirements cannot be met orally, EN should be administered. Parenteral nutrition (PN) should be considered when EN is not indicated or insufficient.

ESPEN state that in polymorbid medical inpatients and in older persons with reasonable prognosis, whose nutritional requirements cannot be met orally, EN should be administered. Parenteral nutrition (PN) should be considered when EN is not indicated or unable to reach targets.<sup>1</sup>

### ICU patients infected with SARS-CoV-2

#### Pre-Intubation Period

## 07 Medical nutrition in non-intubated ICU patients

If the energy target is not reached with an oral diet, ONS should be considered first and then EN treatment. If there are limitations for the enteral route it could be advised to prescribe peripheral PN in the population not reaching energy-protein target by oral or EN.

The commencement of enteral feeding for patients receiving non-invasive ventilation (NIV) may be problematic because the placement of a nasogastric tube (NGT) for nutrition may result in air leakage, and it may result in stomach dilatation that could affect diaphragmatic function, both potentially compromising the effectiveness of the NIV.<sup>1</sup> The above may account for highly inadequate implementation of EN.<sup>14</sup> Peripheral PN may be therefore considered under these conditions.<sup>1</sup>

#### Ventilated Period

## 08 Medical nutrition in intubated ICU patients (I)

EN should be started through a nasogastric tube; post-pyloric feeding should be performed in patients with gastric intolerance after prokinetic treatment or in patients at high-risk for aspiration.

ESPEN state that energy requirements are to be calculated from indirect calorimetry when available. Isocaloric nutrition can be progressively implemented in the early phase of illness with increments up to 80-100% after day 3.<sup>17</sup> However, if not available  $VO_2$  (oxygen consumption) from pulmonary arterial catheter or  $VCO_2$  (carbon dioxide production) derived from the ventilator gives a better evaluation of energy expenditure than predictive equations. If predictive equations are used, hypocaloric nutrition (below 70% estimated needs) is preferred to isocaloric nutrition for the first week of ICU stay.<sup>17</sup> Protein requirements during critical illness, 1.3g/kg protein equivalents per day can be delivered progressively. For obesity, 1.3g/kg "adjusted body weight" protein equivalents per day is recommended.<sup>17</sup>

## 09 Medical nutrition in intubated ICU patients (II)

In ICU patients who do not tolerate full dose EN during the first week of ICU, initiating PN should be weighed on a case-by-case basis.

ESPEN advise that PN should not be started until all strategies to maximise EN tolerance have been attempted. Progression to full nutrition coverage should be performed cautiously in patients requiring mechanical ventilation and stabilisation.<sup>1</sup> It is noted that EN should be delayed in the presence of uncontrolled shock and unmet haemodynamic and tissue perfusion goals; uncontrolled life-threatening hypoxemia; hypercapnia or acidosis. Low dose EN can be started with caution once shock is controlled with fluids and vasopressors or inotropes, and in patients with stable hypoxemia, compensated or permissive hypercapnia and acidosis.<sup>1</sup> In stabilised patients, even in the prone position, enteral feeding can be started, ideally after measuring indirect calorimetry targeting energy supply to 30% of the measured energy expenditure. During emergency times, the predictive equation recommending 20kcal/kg/day could be used and energy increased to 50-70% of the predictive energy at day 2 to reach 80-100% at day 4. The protein target of 1.3g/kg/day should be reached by day 3 to 5.<sup>1</sup> Gastric tube is preferred but in case of large gastric residual volume (above 500 mL), duodenal tube should be inserted quickly. The use of enteral omega-3 fatty acids may improve oxygenation but strong evidence is missing. If intolerance to enteral nutrition is present, PN should be considered.<sup>1,7</sup>

### Post-Mechanical Ventilation Period

## 10 Nutrition in ICU patients with dysphagia

Texture-adapted food can be considered after extubation. If swallowing is proven unsafe, EN should be administered.

There is a high incidence of swallowing problems in patients no longer needing mechanical ventilation; therefore administer EN if swallowing is proven unsafe. ESPEN state that in cases with a very high aspiration risk, postpyloric EN or, if not possible, temporary PN during swallowing training with removed nasoenteral tube can be performed.<sup>1</sup>

## References

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