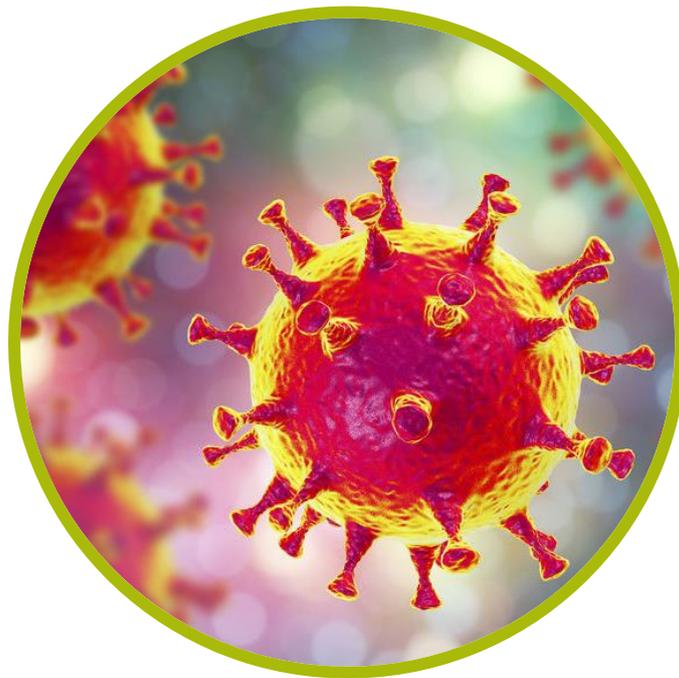


# NUTRITIONAL GUIDANCE DURING RECOVERY FROM COVID-19



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## FOREWORD

Now that the first COVID-19 patients are starting to be discharged from hospital wards, these patients are being directed towards our first-line dietitians to begin their recovery phase post-hospitalization. The information these discharged patients receive in terms of nutritional guidance in their home-setting is often limited. It may also happen that these patients receive a direct referral to the dietitian and/or physiotherapist to undergo rehabilitation.

First-line dietitians are being expected to support these discharged COVID-19 patients following their hospitalization. It is thus important that there are clear guidelines and a care pathway in place.

Based on the available literature and insights gathered from these patients' first experiences in their recovery phase, Diëtheek has created the "Nutrition during the recovery of COVID-19" care pathway. These guidelines are intended for all dietitians working in the primary healthcare setting and who are managing this patient group.

It is important that the physiotherapist and the dietitian collaborate and align their recommendations to provide the optimum care for the patients. We hope that the collaboration between these two disciplines is already strong; however if not we encourage combined efforts to do so. We would like to direct attention towards the position of the KNGF. The reference is: KNGF Standpunt 'Fysiotherapie bij patiënten met COVID-19', versie 1.0, 16 april 2020, KNGF Amersfoort. The most updated version of our position statement can be found at:

<https://www.kngf.nl/kennisplatform/overige-producten/coronavirus-informatiemateriaal-voor-de-fysiotherapeut>

In version 2.0 of these guidelines we strive to create multi-disciplinary treatment guidelines, which could involve the collaboration between for example, but not limited to, physiotherapists and speech therapists.

This care pathway has been set up and customised by dietitians Ivette Schuurman and Danita van der Linden from Diëtheek Nederland. Proof-reading, feedback and formatting have been carried out by colleagues Johan Bruijnen, Jet oude Reimer, Berry van Kats and Daniëlle Horstman.

As there is a current lack of evidence to inform how to best manage these patients, this care pathway has been based on knowledge and first-hand experience of professionals. We would like to give special thanks to Hinke Kruizenga, Elke Naumann and Peter Weijs for the valuable feedback and support in creating this care pathway.

We would like to acknowledge Dr Ceri Green from Nutricia Specialized Nutrition, and her colleague Anne de Vries for their great help in translating the guideline.

These guidelines have been diligently created, and stem from the current insights and research on COVID-19. There is the possibility that these will need to be modified in the future, due to emerging evidence and practice-based guidelines.

If you would like to use information contained within these guidelines, please reference the document as follow: Diëtheek 2020. Richtlijn voeding bij herstel na COVID-19 [Nutritional guidance for recovery from COVID-19].

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## SHORT INTRODUCTION

This document concerns the care pathway for recovery following COVID-19 discharge.

The energy requirements of COVID-19 patients are strongly influenced by their physiological status. The clinical symptoms experienced by these patients, in particular fatigue and dyspnea, create difficulties in obtaining an adequate nutritional intake. Therefore, it is important that the gap between energy expenditure and energy intake is corrected. An increase in disease severity often coincides with an increase in energy requirement. Attention and emphasis on energy intake is therefore desirable.

It is possible for patients who have spent time on the Intensive Care Unit (ICU) to develop "Post ICU-syndrome." More information on this topic can be found in "Appendix 2". During the nutritional intervention it is very important to (continue to) work closely together with the physiotherapist on the physical exercise intervention.

Dietetic care is methodical (see the outlined 6 steps on treatment methodology in Appendix 4), evidence or practice-based, and informed by national guidelines. Diëtheek strives for dietitians to implement care pathways (governed by protocols) specific to each disease condition.

Through utilizing management protocols, Diëtheek aims to ensure uniformity and quality of care. Another reason for utilizing protocols to guide the care is to ensure that every care pathway has an explicit description as to what information needs to be documented in the digital patient dossier. Diëtheek uses these results in order to continuously improve the quality and outcome of the patient's care.

The referral diagnoses and the dietetic diagnosis determine the management process and guide the implementation of the care pathway, whereby the approach of "your personal dietitian" is guaranteed.

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## DIËTETIC ASSESMENT:

The following characteristics and factors are important to elucidate. To reach a dietetic diagnosis faster, the ICF-table can be used.

### Referral diagnosis

- Unintentional weight loss
- Malnutrition
- Underweight BMI < 18,5
- Overweight BMI 25-30 adult
- Overweight BMI 30-35 adult
- Overweight BMI 35-40 adult
- Overweight BMI > 40 adult

\*See Appendix 2 for Malnutrition risk indicators

### Anthropometry:

- Length, weight, usual weight, BMI, waist circumference
- Weight progression over time (current weight, weight 1 week prior, weight 1 month and 6 months prior)
- Body impedance analysis(?) when possible (Gallagher-formula, Omron, Biostat, Tanita)  
Upper arm circumference

### Functionality\*:

- Current and usual physical activity
- Functional limitations
- Fatigue
- Handgrip strength (if possible for dietitian to measure, check with appropriate physiotherapist)
- Leg muscle strength, walking test, fitness test

\*When a patient indicates feelings of weakness, has fallen, has a slow walking speed, has difficulties with rising from a chair to standing position or difficulties walking stairs, further evaluation of the potential presence of sarcopenia is warranted. For this use SARC-F screening tool, in Appendix 3 This will be measured following the first week, the first month and following three months of treatment.

Relevant laboratory markers if co-morbidities present (if applicable)

Type of lab	Reference values
HbA <sub>1c</sub>	
Systolic/diastolic pressure	
EGFR	
Gamma GT	
ALAT/ASAT	
TG	
Cholesterol levels	
BSE (sedimentation)	
Hemoglobin	

**Symptoms**

- Unintentional weight loss
- Fatigue
- Nausea
- Vomiting
- Problems with swallowing and chewing
- Loss of taste and/or smell (decreased/changed)
- Decreased appetite (VAS)
- Intestinal problems – bloatedness, diarrhea
- Severe stomach pains
- Constipation; frequency and Bristol Stool Chart
- Shortness of breath (degree of oxygen support level, saturation)
- Ageusia; loss of taste and/or smell (decreased/altere
- Gastroparesis,
- Edema

**Comorbidity:**

- Hypertension
- Hypercholesterolemia and hyperlipidemia
- Heart failure
- Diabetes Mellitus

Resulting co-morbidity:

- Intestinal complaints
- Apnea
- Asthma
- COPD
- Gastro-intestinal problems/constipation and malabsorption
- Sarcopenia
- Sarcopenic obesity

Medication (and the influence of this medicine on the diet)

Type of medication	Action	Brand name	Side effects/complications
Chloroquine	Kills certain parasites, such as malaria. Reduces inflammation in rheumatism and lupus erythematosus	A-CQ 100 Chloroquine	<ul style="list-style-type: none"> <li>- -Decreased appetite</li> <li>- -Too low glucose level</li> <li>- -Bowel discomfort</li> <li>- -Cardiac arrhythmia</li> </ul>
Hydroxychloroquine	Kills certain parasites, such as malaria. Reduces inflammation in rheumatism and lupus erythematosus	Plaquenil Hydroxychloroquine	<ul style="list-style-type: none"> <li>- -Decreased appetite</li> <li>- -Bowel discomfort</li> <li>- -Cardiac arrhythmia</li> </ul>
Ritonavir	Inhibits virus (inhibits the growth of virus causing HIV)	Norvir Ritonavir	<ul style="list-style-type: none"> <li>- -Bowel discomfort</li> <li>- -Increases likelihood of gout if at risk</li> <li>- -If susceptible for DM, can increase likelihood of its development</li> <li>- -Can interfere with /disrupt existing DM</li> </ul>
Lopinavir met Ritonavir	Inhibits virus (inhibits the growth of virus causing HIV)	Kaletra Lopinavir/Ritonavir	<ul style="list-style-type: none"> <li>- -Decreased or increased appetite</li> <li>- -Too high levels of serum fat and cholesterol, which can lead to increased chance of HVZ (?)</li> <li>- - If susceptible for DM, can increase likelihood of its development</li> <li>- -Can interfere with /disrupt existing DM</li> </ul>
Anticoagulant	Decrease or delay clotting of the blood	Acenocoumaro	<ul style="list-style-type: none"> <li>- When using Acenocoumarol, seek nutritional advice, especially regarding vitamin K.</li> <li>- Pay attention when using alongside oral nutritional supplements</li> </ul>

### **Nutritional therapy**

Oral nutritional supplements (ONS) or enteral tube feeding

Additional/supplemental modules

### **Food supplements**

- - Attention to vitamin D
- - Attention to vitamin K (in case of thrombosis)

### **Medication, in regards to comorbidity**

- Diabetes medication
- Pain medication
- Corticosteroids
- Immuno- suppressive medication

### **Medical history**

- - Underlying syndromes and respective treatments
- - Duration of hospitalization
- - Duration of potential ICU stay
- - Duration of participation in rehabilitation setting or care facility

### **Which other healthcare sectors are involved**

- - Psychologist
- - Physiotherapist
- - Social worker
- - Home care
- - anticoagulation service
- Speech therapist
- Occupational therapist

\*In case anticoagulation service is applicable and this client receives enteral tube feeding; please inform patient and appropriate institution, for example by information on vitamin K (see folder within Evry, oral nutritional supplements for thrombosis service)

### **Lifestyle factors (prior to COVID-19)**

- Sitting: ... hours per day
- Movement: ... hours per day, hours per week, type= measure of intensity
- Physical exercise: ... hours per week, type of exercise (strength and/or cardio)
- Sleeping: quality and amount of hours
- Stress: quantified 1-10 (10 is most)
- Smoking behavior: drugs, marijuana, amphetamine
- Alcohol consumption: amount per day

### **Eating behavior (nutrition/nutrient intake)**

- Nutritional history – food diary, digital diary, Eetmeter
- Attention for energy, protein, meat (replacements), dairy
- Meal preparation abilities

### **Personal factors:**

- Age, gender – always reported in dossier
- Ethnicity
- Living situation: alone, family, house, apartment
- Education/occupation
- Hobbies
- Language comprehension
- Financial situation
- Psychiatric conditions

### **Mental factors**

- Motivation
- Attitude
- Expectations of treatment
- Which barriers could impede on behavior changes

## DIËTISTISCHE DIAGNOSIS

The dietetic diagnosis is made based on the dietitian's investigation (using the ICF table). Following this, the treatment goals are established. In order to achieve the objectives listed below, an active collaboration between the physiotherapist and eventual other care providers is desirable.

### GOALS

- Improve functionality in everyday life.
- Maintain and/or improve nutritional status.
- Maintain and/or improve fat-free mass/muscle mass.
- Monitor well-being.
- Monitor clients with complicated nutrition-related problems.
- Support the diminishing/improvement of symptoms.
- Support in improving or maintaining quality of life.
- Prevent refeeding syndrome.

### DIETARY CHARACTERISTICS

- Guidelines for good nutrition
- Energy and protein rich nutrition (estimated using the WHO formula, the Harris and Benedict formula or measurement) + conditions
- Protein requirements: 1,2 to 2,0 g/kg actual bodyweight
- Underweight (BMI <20) 1,2 to 1,5g/kg actual bodyweight (with BMI <20 extrapolated to BMI=20)
- Overweight (BMI > 30) correct weight in this context by weight and BMI=27,5, respectively
- Vitamins and minerals: all requirements determined by 100% RDA, unless there are indicated deficiencies or increased requirements. For COPD: Calcium 1000-1200mg. Frequent consumption of corticosteroids as well as immobility contribute to osteoporosis risk.
- Vitamin D: recommendations/requirements according to public health recommendations
- Fluid: minimum of 1,5 liter and any losses

\*Nutritional recommendations will depend on physical activity and disease-related symptoms, such as Diabetes Mellitus and kidney failure. In this case, follow other nutritional guidelines. (Dieetbehandelrichtlijnen COPD, 2017, Artsenwijzen diëtetiek, ondervoeding, 2015, Artsenwijzen diëtetiek, longziekten, 2016)

- Appropriate spreading of nutrition across the day/increase the frequency of meals. It is preferred that every meal contains 25g protein.
- Eating in a slow and calm manner, in the appropriate position.
- If there is uncertainty about achieving adequate energy and protein intake, start oral nutritional supplements or additional modules (e.g. Prosource or Protifar), or continue use of oral nutritional supplements after hospital discharge. (2020, Barazzoni R, et al)
- It can occur that a client will be prescribed a soft/modified texture diet by a speech therapist. This occurs often in the ICU setting and can also extend beyond the ICU for these patients. Older patients typically spend a longer time in ICU and therefore are likely to follow such a diet for a longer period of time. The soft foods and liquid can be less taxing for those that suffer from fatigue. Discuss recommendations with respective speech therapist for the home situation if appropriate.
- Discuss recommendations with appropriate physiotherapist and potentially modify according to the intensity of the movements, exercises or trainings.
- With sarcopenic obesity:  
Protein are complete, high quality, and are offered multiple times per day.

Energy intake can be lowered to approximately 300-600 kcal below the usual energy requirements as long as nutrition remains complete. This does not involve any stringent carbohydrate restriction. Only the fast-absorbed monosaccharides and disaccharides are favorable to remove from the diet in regards to optimizing blood sugar levels.

**For further dietary characteristics see Appendix 1 and 4.**

### ***Individual***

The diet prescription is related to any medications taken by, and weight of, the individual.

It is important to, in alignment with the client, select the most appropriate diet. This means selecting a diet that aligns closest to their normal diet/dietary behavior, and one that the client finds sustainable to adhere to. It is recommended to adapt the dietary advice to the following individual wishes and needs:

- Budget
- Religion
- Culture
- Conviction
- Knowledge

Attention to adherence, as well as adjustments to the chosen diet when necessary, are of importance.

## LIFESTYLE

- Physical activity is based off consultation and recommendation of physiotherapist.

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## NOTEWORTHY POINTS WITH REGARDS TO PSYCHOLOGICAL FACTORS

- Discuss the relationship between stress and eating behavior with client if the client appears to be suffering from high stress.
- Take into account that the client can feel dissuaded to consume routine meals due to fear of swallowing issues.
- Development of PICS (Post-ICU Syndrome), see Appendix 4:
- Note: It is not the duty of the dietitian to instruct the client on how to deal with physiological and societal stressors. If the client is faced with these stressors to an extent that the gastrointestinal system is influenced, then the dietitian can share with the client the various ways of coping with stress. If the client is open to it, the dietitian can refer the client to a doctor in order to instruct the client on ways to cope with stressors (for example, social worker or psychologist).

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## PARTICULAR WATCH-OUTS

Attention to medications with COVID-19; Chloroquine© en Lovinavir/Ritonavir©. Side effects in the form of stomach/gastrointestinal and psychological symptoms (see Medication review table page 7). Chloroquine© also increases the risk of hypoglycemia. Therefore it is not advantageous to regulate the DM too tightly. Sips of nutritional juices, apple juice or orange juice are permitted. Hyperglycemia is less likely to occur. In the case it does occur, additional insulin injections can be implemented.

### GOAL OF DIETARY MANAGEMENT

- Which goals does the client want to achieve?
- How is he/she going to achieve these?
- What is the duration and frequency of the intervention?

Formulate the management goals in a SMART way so that it is clear which variables will be measured and evaluated.

### DURATION OF THE DIETARY MANAGEMENT

Care level 4

Duration of therapy is dependent on the clinical picture and the selected nutritional support. For guidelines on the duration of care for each clinical picture, it is suggested to consult the appropriate treatment protocols.

### PRINCIPLES TO GOVERN CONSULTATIONS

Dietitian's first actions as first-line support following a referral:

- Dietitian calls the patient within 2 to 3 workdays post-discharge
- Organize, if necessary, the authorization of supplemental nutrition for home use (pharmacy, Sorgente, Mediq Tefa, Medireva Eurocept).
- Initiation of eventual follow-up appointments and the time period before the follow-up appointment according to the wishes of the client.

## CONTENT OF CONSULTATIONS

Leaflets and brochures are given to client, to supplement the dietary management, based on decision of dietitian. It is not an issue if another order (?) of informational materials would better suit/guide the client. Always make note of which materials you give to the client, or what you have agreed to deliver to the client and by which date, after each consultation.

First consultation: 60-minute intake session (30 minutes direct with patient and 30 minutes indirect time for dietary plan. Keep in mind this consultation is always by phone!

### **If tube feeding is appropriate**

*1<sup>st</sup> consultation: 60 minute intake session (30 minute direct with client and 30 minutes for administration). Keep in mind this is always a virtual (via the telephone) consultation.*

*(Consultation is intentionally short, seeing how the client has only very recently left the hospital. Short and long-term goals are established during the second consultation).*

**Consult 2:** After 1 week (30 minutes contact with client via the telephone)

Short and long-term goals are established, following the SMART methodology, during this consultation.

**Consult 3:** After 1 week (30 minutes contact with client via the telephone) and if necessary, 15 minutes administration time

**Consult 4:** After 1-2 weeks (30 minutes contact with client via the telephone or eventual home visit)

**Consult 5:** After 1-2 weeks (30 minutes contact with client via the telephone)

Note: keep in touch with physiotherapist throughout the entire treatment, so that the nutritional and physical exercise recommendations/interventions remain aligned.

If there has been use of tube feeding at any point during the treatment, the treatment minutes will not be reflected in the treatment time mentioned above.

**Sixth consult:** after 3-4 weeks (30 minutes)

### **Relapse prevention plan**

- Make agreements on monitoring of nutritional status, as well as agreements as to when the treatment should be resumed
- After 3 months, assessment of nutritional status by dietitian, as well as assessment of overall health by general practitioner.
- After 6 months, assessment of nutritional status by dietitian, as well as assessment of overall health by general practitioner.

**In the case of overweight or obesity**

- Agreements and set goals to facilitate lifestyle changes, always in line with current circumstances.
- Following 1 month, assessment of nutritional status by dietitian, as well as assessment of overall health by general practitioner
- Discuss ways in which to further guide the client towards obtaining a healthy weight and lifestyle.

**In the case of stomach or intestinal symptoms**

- Make appointments and establish goals in order to support the clients with their existing symptoms.
- Following 1 month, assessment of nutritional status by dietitian, as well as assessment of overall health by general practitioner.

The total treatment duration is 4 hours (16 x 15 minutes); if tube feeding becomes appropriate and implemented this duration time is not applicable.

### FATIGUE

- Use lightweight cutlery so that eating and drinking costs minimal exertion
- Utilize soft and/or liquid nutrition
- Potentially use a short straw when drinking
- Ensure proper rest prior to meal
- Introduce the largest meal of the day at the best moment of the day for the patient
- Offer multiple smaller portions on daily basis. Resistance can be seen with larger portions; try to consume something every two hours
- If the patient provides him/herself with own meals or indicates to potentially make use of meal facility, then chose for a meal requiring easy preparation. Also explain the nutritional value of a sandwich.
- Eat something prior to going to sleep, or potentially place food on the nightstand
- If patient is on oxygen support, then also provide this as well during the meal.

### NAUSEA

- Routinely, approximately 6-8 times per day, consume smaller-sized portions to prevent an empty stomach
- Offer cold food; for example offer cold-cuts instead of a piece of meat as part of a warm-meal. A meal consisting of sandwiches (bread-based) or meal-sized salad would also be sufficient.
- Limit strong smells coming from food and drink. If possible, allow the meals to be prepared by someone else, warm them up in the microwave, and consume liquids using a straw.
- Consume sufficient liquids, preferably those with nutritional value such as dairy-based products.

### MUSCUS FORMATION

- As part of the dietary management, it is necessary to emphasize the use of milk products, as patients have a tendency to dismiss them based on an incorrect notion that they can contribute to mucus formation.
- Use foodproducts that have a refreshing/sour taste, such as yogurt and kwark
- Routinely take small sips of cold water while eating or drinking. Also do this when consuming oral nutritional supplements.
- Consume an ice lolly following intake of milk products, as this is refreshing and will help eliminate the mucus build up.
- Consume a sip of water or fruit juice following intake of milk products.

## DIARRHEA

- Drink sufficient amounts to compensate for fluid loss
- Consume smaller sized meals throughout the day, to minimize agitation of the gastrointestinal tract.
- Limit the intake of lactose; chose for more sour milk products such as yogurt and kwark instead of sweeter milk products such as chocolate milk or pudding. Oral nutritional supplements contain minimal lactose so therefore no restrictions are needed for this.

\*For general nutritional recommendations/tips or information related to COVID-19, please make use of [www.voedingscentrum.nl](http://www.voedingscentrum.nl) en [www.goedgevoedouderworden.nl](http://www.goedgevoedouderworden.nl)

## LOSS OF SMELL AND TASTE

- Experiment with the factors listed below.
- Eat with caution.

### Texture

- Different structures; add vegetables to an omelet
- Steam vegetables to keep them crisp;
- Chop nuts into small pieces and use them as toppings;
- Variation in solid and liquid structured-foods;
- Fried and baked goods is experienced more pleasantly than cooked dishes;
- Add dried fruits;
- Carbonated soft drinks provide a pleasant mouthfeel.

### Spiciness/hotness

- Use tabasco or salsa to make a dressing;
- Spicy sauces such as curry paste or piri piri. The taste can be made more mild by the addition of a spoonful of yogurt;
- Mustard or radish can be used to bring dishes to desired taste level.

### Dish presentation and temperature

- Stimulate the appetite by serving dish on a nice-looking plate or present dish in an appealing way
- Variation in color ensures the meal is appetizing;
- Make use of different temperatures within a meal.

### Smell and taste

- Emphasize the basic tastes: these are still present with an olfactory disorder;
- Strengthen the taste by adding herbs and spices;
- Asafoetida, known in the Asian cuisine, is a pleasant taste-enricher.

**APPENDIX 2 MALNUTRITION RISK INDICATORS**

**GLIM CRITERIA**

Weight loss, decreased intake and disease burden. Based on the GLIM criteria, patients are moderately to severely malnourished during hospitalization and/or during their stay in the ICU. Overweight and diabetic individuals can also be malnourished, as well as also susceptible to contracting COVID-19.

- Unintentional weight loss, determined by validated screening tools such as SNAQ or MUST
- Low BMI
- Decreased muscle mass
- Decreased food on nutritional intake (?)
- Disease burden/infection

**MALNUTRITION RISK INDICATORS**

- BMI < 18,5 (18-69 years)
- BMI < 20 (70 years or older)
- BMI < 21 (COPD patients)
- Unintentional weight loss of >10% in 6 months
- Unintentional weight loss of 5% in 1 month. See malnutrition steering committee tables

Unintentional weight loss	Low BMI	Decreased muscle mass
>5% in ≤6 months OR >10% in > 6 months	<20kg/m <sup>2</sup> for <70 years old <22 kg/m <sup>2</sup> for ≥70 years old  Asian population: <18,5 kg/ m <sup>2</sup> for <70 years old 20 kg/m <sup>2</sup> for ≥70 years old	Decrease determined by use of validated method, for example BIA, DEXA, CT-scan

**Reasons for increased energy requirements**

Shortage of nutrients	Disease burden/inflammation
>1 week ≤50% of the energy requirements OR >2 weeks decreased intake/uptake (regardless of extent of decrease)  OR A chronic gastrointestinal condition that disrupts intake or absorption	Acute disease, trauma, or chronic associated with disease-related inflammation

APPENDIX 3 SARC-F

Screening for the risk of sarcopenia precedes diagnosis of sarcopenia. The SARC-F questionnaire is advised for screening. This is a questionnaire containing five sections, which the patient can complete individually or together with the dietitian. The answers are designed to convey the patient's perception of own strength, walking ability, standing up from chair, climbing stairs, and experience with falls.

**Patients with 4 or more points have an increased risk for**

Component	Question	Scoring
Strength	How much difficulty do you experience with lifting and carrying 5 kgs?	None= 0 Minimal = 1 A lot, or not possible= 2
Assistance with walking	How much difficulty do you experience walking across a room?	None= 0 Minimal = 1 A lot, do so with walking aid, or not possible= 2
Standing up out of chair	How much difficulty do you experience rising up out of a chair, or getting out of bed?	None= 0 Minimal = 1 A lot, or not possible without assistance= 2
Climbing of stairs	How much difficulty do you experience walking up 10 steps of stairs?	None= 0 Minimal = 1 A lot, or not possible= 2
Falls	How many times have you fallen in the past year?	Not once= 0 1-3 times= 1 4 or more times =2
Total score	Score $\geq$ 4: high risk of sarcopenia	

Note: malnutrition and sarcopenia are two different conditions. Malnutrition stems from an imbalance between nutritional intake and energy expenditure. This results in weight loss, accompanied with decreased muscle mass and typically a low fat mass as well. This therefore impacts the entire body.

Sarcopenia, also referred to as muscle failure, involves decreased muscular strength and therefore is a condition that only impacts the muscular system. For malnutrition, the treatment is focused on the recovery of the imbalance between the nutritional intake and energy expenditure, in which case the nutritional care can positively impact the muscle mass as well. With sarcopenia, the treatment/care is primarily focused on improving the muscle function, while strength training and nutrition serve as important contributing factors. Collaboration with the physiotherapist is crucial in this context.

Malnutrition can result in sarcopenia; both disease conditions can occur simultaneously. In practice, it is important to be aware of both, and moreover be critical in the assessment and diagnosis of both.

## APPENDIX 4 PICS POST ICU SYNDROME

Post-ICU Syndrome (PICS) is a combination of symptoms that patients can experience following their stay in the ICU.

The stay in the ICU and overcoming a critical illness can result in physical, psychological and cognitive problems, as well as diminished quality of life. Since 2012, this has been referred to as Post-ICU Syndrome (PICS). The severity and nature of the PICS symptoms can vary per individual. The rehabilitation and recovery process is therefore also different per patient. These PICS-symptoms are in addition to the health problems derived from the initial disease.

### SYMPTOMS

The Post-ICU Syndrome consist of the persisting health problems following the stay in the ICU. These can include physical symptoms, as well as conditions that interfere with attention and memory, thoughts, mood and emotions. It is possible that these conditions persist for a long time, in which case these conditions can impact an individual's social life as well. An example could be returning to work.

Diagnosis of PICS can be difficult for caregivers, as it remains fairly unknown within our current health care system. The unawareness of PICS can cause a patient to feel misunderstood, contributing to feelings of loneliness and social isolation.

### PHYSICAL SYMPTOMS

The most commonly occurring conditions following the ICU-stay are fatigue, muscle weakness and (nerve) pain. In addition, shortness of breath, hair loss, joint discomfort and a weakened immune system can also be present. The extent to which the patient will suffer from these conditions is dependent on the health status of the patient prior to ICU-admission, the duration of the ICU admission, whether the patient is on ventilation and/or if the patient has experienced something such as delirium (?).

Muscle weakness occurs because of the prolonged bed-rest, and the sleep medication given to patients during ventilation. In addition, severe infections can result in damage to the muscles and nerves. Muscle weakness can greatly impede the patient's daily activities, such as walking, eating and ability to care for self. Physiotherapy during the ICU admission and following hospital discharge is necessary to facilitate a proper recovery, which can take a year if not longer.

## COGNITIVE SYMPTOMS

PICS can lead to issues with memory, concentration, language (such as remembering words), as well as mental acuity and problem-solving abilities. The cognitive symptoms experienced can impair the patient's functional independence, ability to work again or complete tasks that require significant concentration. Similar to the physical symptoms, overcoming these conditions, or fully recovering, can take at least one year.

## PSYCHOLOGICAL SYMPTOMS

Patients previously in ICU can face psychological problems. Post-traumatic stress disorder (PTSD), depression and anxiety disorders often occur. The severe illnesses and the accompanying treatments the ICU-patients undergo are very impactful on their wellbeing. Throughout their experiences, they can have feelings of anger, sadness and helplessness. Signs of flashbacks, avoidance of memories, severe irritation, problems with sleeping, extreme stress and/or easily startled can indicate presence of PTSD. It is also possible that depression develops during the ICU-stay; the patient can feel gloomy, lack interest and lose his/her appetite. An anxiety disorder can be present if the thought of being admitted to the ICU causes the patient anxiety/panic.

After approval by the patient, discuss these matters with the doctor in order to provide support or give a referral.

## RETURNING BACK TO WORK

Symptoms of PICS make it difficult for many patients to return back to work. Half of ICU-admitted patients do not return to work within one year of discharge, and 1/3 don't ever return to work. This can result in a separate slew of problems, such as lack of income. Due to the unawareness of PICS from the employer, the UWV, the company doctor and the insurance doctor, the outlook of these patients is often strongly overestimated, as the expectations for their speed, measure and options for reintegration into society are unrealistic/set too high.

## DIETETIC CARE PATHWAY

The dietitian care pathway has been developed by the gathered input of specialized dietitians from the ICU and nursing wings from the following hospitals: Amsterdam UMC (location AMC and VUmc), Amstelland Hospital, OLVG West, OLVG Oost, BovenIJ Hospital and front-line dietitians of Malnucare.

The objectives of this care pathway are:

- Optimization of PICS patient care
- Timely identification and management of PICS
- Ensure effective collaboration of the relevant healthcare professionals involved in treating PICS patients

In this care pathway for PICS, the following topics are covered: identification/recognition, diagnosis, treatment, handover and multidisciplinary collaboration.

## Diagnosis

1. Assess the nutritional status
2. Recommendation: incorporate health-positivity into care plan

## Measurements

- Length, weight (BMI)
- Body composition (BIA)
- Nutritional intake
- Appetite (VAS)
- Any measures to reflect which individual treatment goals of the patient have been achieved

## Treatment objectives: Optimizing the nutritional intake

- Advocate for the optimal combination of nutrition and movement
- The other treatment objectives differ per patient.

## Treatment evaluation

- Food intake
- Represented as percentage of need
- The intake is sufficient if at least 100% of the energy and protein needs are met
- Weight and weight progression
- Functionality and body composition
- Disease progression
- Nutrition-related conditions/complaints
- Barriers
- Specific measures to reflect personalized goals that have been achieved.

Adjust the treatment when necessary. If treatment has been completed, this needs to be communicated to the general practitioner in the form of a final report

#### TRANSFER TO THE PRIMARY DIETITIAN OR OUTPATIENT CLINIC DIETITIAN

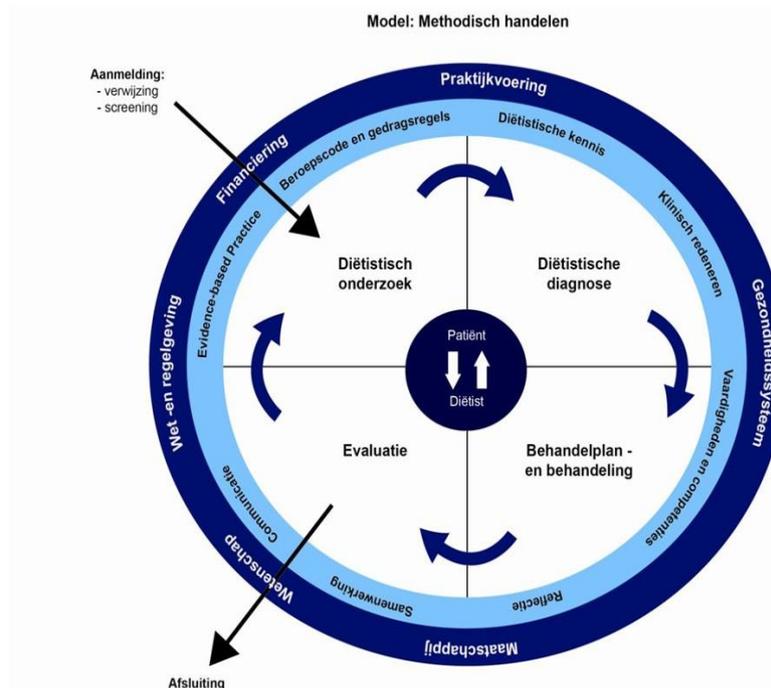
The primary dietitian (front-line?) oversees the PICS patients if they are transferred from the hospital or other healthcare facility. The dietitian cares for these patients in the outpatient setting or visits their homes (home-visits). The form of this transfer is verbally (via the telephone) and is followed by a written/electronic transfer.

#### GENERAL RECCOMENDATIONS

It is important to already have begun with physical exercises and loosening of the joints, either done at home or led by the rehabilitation center, prior to the moment of patient intake. Speak about the experience within the ICU. It appears that reading another patient's diary entries on their ICU-experiences, with accompanying pictures, helps the patient to process.

Do memory exercises, crossword puzzles and read small excerpts from the newspaper or magazine.

Inform the general practitioner or medical specialist if the patient displays signs of PICS. He/she will be able to direct the patient towards more specialized care.



- 1. Registration/Enrollment:** When the client enrolls him/herself directly with the dietitian instead of customer service, it is up to you to collect the relevant information. This information should include personal information, medical history and any additional information. If the patient doesn't have a referral, then also follow "Directe Toegankelijkheid Diëtetiek (DTD) to complete this enrollment process"

### Patiënt informatie

Relevant patient information should be recorded using the following checklist:

1. NAW-patient information
2. Insurance information
3. BSN/birthdate
4. Referral + AGB-code information (*If 1<sup>st</sup> referral, preference for doctors; if second then refer to specialist*)
6. Diagnosis code
7. Identification BIG-MKC Dietitian verification + second referral/specialist
8. C.O.V verification

### 2. Dietetic investigation

Carry out a dietetic investigation, as that represents the diagnostic component of dietetic care. You bring the functional status of the patient to light, as well as the factors influencing this. This is described in The International Classification of Functioning, Disability and Health for the Dietitian (ICF-Dietitian).

In doing so, you outline and define the patient's request for help, their expectation and motivation. Additionally, in this way you elucidate the medical, research, dietetic and psycho-social – of the patient as well.

### **3. Dietetic diagnosis**

Following this investigation, you formulate a dietetic diagnosis. This represents your professional assessment on the health profile of the client. In this dietetic diagnosis, you capture the functional limitations of the client. Central to this are the nutritional deficits, as well as the indicated medical, external and personal factors affecting these deficits. Moreover, the association between the cause and consequences of the limitations making up the diagnosis are made explicit, which is formulated based on the ICF-model. The terms of this are articulated in the ICF-Dietitian. The dietetic diagnosis is the bridge between research (the diagnostic element) and treatment (the therapeutic element). The basis of the care pathway originates from this.

### **4. Treatment plan and treatment**

In the treatment plan, the established objectives to be achieved by the nutritional intervention, are outlined. Moreover, the proposed way these will be achieved and the duration and frequency of the intervention are outlined. The treatment objectives are formulated according to SMART. In this way, it is defined which variables will be employed to assess the treatment/care.

### **5. Evaluation**

In every consultation the care process is evaluated and you can implement any necessary modifications.

### **6. Reporting and concluding the treatment**

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