



MINISTRY OF HEALTH

**Interim Guidance for Nutrition and Dietetics
Management of COVID-19 for Health Workers in
Treatment and Isolation Centres**

April 2020

FOREWORD

The Interim guidance for nutrition and dietetics management of COVID-19 has been developed in response to the Corona virus disease which is a serious respiratory viral infectious disease caused by a newly discovered corona virus. The outbreak started in Wuhan City, China and has since spread globally. The COVID-19 pandemic poses a danger to all population groups with older persons and those with underlying medical conditions like cardiovascular disease, diabetes, chronic respiratory disease and cancer likely to develop serious illness.

Nutrition plays a key role in improving immunity of an individual, lowering the risk of chronic illnesses and infectious diseases and in speeding recovery from illnesses. People living with chronic illness, who are suspected or confirmed to be positive for COVID-19, may need support for their diet at home and in healthcare facilities while critically ill COVID -19 patients may require specialized nutrition and dietetics services. Therefore, integrating nutrition and dietetics care in the management of the disease is one of the important measures to ensure high quality of care and overall better treatment outcomes.

These guidelines cover general recommendations for management of nutrition relevant signs, symptoms and conditions that may present at each stage of the disease. It also gives a highlight of nutrition management in the context of maternal, infant and young child nutrition. The guidelines will be regularly updated based on developing evidence and experience worldwide.

It is recommended that health care providers use these guidelines while providing services to patients with COVID -19 and to the general population. The guideline should be used together with the other guidelines developed for the prevention and Management of COVID-19.



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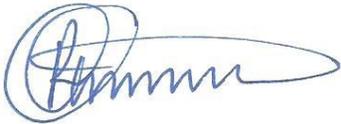
ACKNOWLEDGEMENT

The Interim guidance for nutrition and dietetics management of COVID-19 has been developed by the Division of Nutrition and Dietetics, Ministry of Health with technical contribution from clinical nutritionists drawn from Kenyatta National Hospital and private practices.

The Ministry of Health would like to thank all those who participated in the development of these guidelines for their invaluable time and expertise, under the guidance of Veronica Kirogo, head Division of Nutrition and Dietetics (DND) and Leila Odhiambo, deputy head DND.

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1.0 GUIDANCE FOR ALL PATIENTS

1.1 Introduction

COVID -19 presents a period when nutrition requirements are elevated as a result of impaired nutrition intake, impaired ability to utilize nutrients, increased inflammation and immobility consequently impacting negatively on immunity. Nutrition management/treatment is crucial to prevent fat free mass loss and enhance immune response for an infected person against RNA viral infection. There is sufficient evidence to demonstrate that immune response can be weakened by inadequate nutrition.

Therefore, verification of the nutritional status of COVID-19 patients before/during and after the administration of general treatment and providing appropriate nutrition and dietetics interventions should be an integral part of overall care.

The use of a normal modified diet as the base for any nutrition management is encouraged. Consider Enteral and Parenteral nutrition based on the possible deficiency, increased need because of disease/illness or other modes of feeding if the normal food intake is inadequate or not possible.

Note: The following key messages are general guidance for nutrition management of COVID-19 based on accompanying symptoms. Consultation with a licensed and practicing dietician/nutritionist is recommended for individualized care.

1.2 Symptoms of COVID 19 With Nutrition Implications

The symptoms of COVID-19 range from mild to severe symptoms that need specialized management. The symptoms are;

- a) Uncomplicated Illness-runny nose, fever, cough, headache, sore throat
- b) Mild pneumonia- breathing difficulty, inflammation in the lungs
- c) Severe pneumonia
- d) Acute respiratory distress syndrome
- e) Septic Shock
- f) Kidney failure

1.3 Enteral feeding

- Patients receiving inadequate oxygen may complain of anorexia, early satiety, malaise, bloating, and constipation or diarrhea.
- Incubated patients usually require enteral tube feeding or parenteral feeding.
- Decreased duration of mechanical ventilation increases the likelihood of appropriate enteral feeding, thus leading to better clinical outcomes.

- The gastrointestinal route is preferred, although aspiration and bacterial overgrowth are concerns.
- Feeding procedures that minimize aspiration include the use of a continuous method of feeding rather than large bolus feedings, tube placement in the duodenum rather than the stomach, the use of small-bore nasogastric feeding tubes, chest elevation to at least 45 degrees, frequent evaluation for gastric residuals, and endotracheal tube cuff inflation.

2.0 NUTRITION MANAGEMENT OF COVID-19 SYMPTOMS

2.1 Nutrition Management for Mild Symptoms

The symptoms include runny nose, fever, cough, headache and sore throat.

Recommendations

- Ensure intake of adequate fluids; at least two liters of water per day or more if there is fever.
- Fever increases the need for more calories: Increase the amount of nutritious food by increasing the number of times you eat. The food should include a variety of foods including energy-rich foods, meat, milk, legumes and pulses, fruits and vegetables.
- Consider supplementation with Vitamin C, zinc, Vitamin A, B6, D, E, iron, Folate and fiber if not getting enough from the diet.
- Ensure enough sleep, reduced stress, exercise, avoid intake of alcohol and tobacco products.
- Coughs may be relieved by use of honey and warm/hot fluids or beverages including warm water, clear soups or warm juices. A salt water gargle can reduce phlegm and mucus which may lessen the need to cough.
- Sore throat can be relieved by taking tea, honey, ginger, turmeric.
- The use of culinary herbs like oregano, sage and cinnamon as well as increased consumption of fruits and vegetables is encouraged to improve antioxidant levels in the body.
- Limit intake of refined carbohydrates such as sugar, sweets, cake, soft drinks and sugar sweetened beverages.
- Limit intake of foods containing trans-fats and saturated fats e.g. fat and skin from meat, hydrogenated vegetable oils, shortening, fried foods, cookies, and pastries.
- Fluid intake should be based on weight, on average 40kg-60kg 1.5L-2.0L, 60-80kg 2.0L-2.5L, above 80kg 2.5L-3.0L or 30-35mL/kg with allowances for extra losses via drains.

Note: some caution should be used with elderly patients or other patients who may have reduced cardiac/renal function (20-25mL/kg is suggested starting point for IV fluids). AI 2.1-2.6L of fluid per day for adults

2.2 Nutrition Management for Pulmonary Disease

Pulmonary disease includes Mild pneumonia, severe pneumonia, and acute respiratory distress

Nutrition relevant signs and symptoms in pulmonary disease

a) Cough

- Use honey and lemon, warm water/fluids.
- Continue taking prescribed medication.

b) Early satiety

- Eat small frequent nutrient dense meals

c) Anorexia

- Eat preferred nutritious meals or snacks. Increase intake of fruits. Vitamins and mineral supplements may improve on appetite and food intake.

d) Patients with Weight loss

- Ensure adequate intake of food from all food groups.
- Adequate protein intake is key to prevent muscle wasting.
- Protein 1.2-1.7g/kg/day
- Energy 30-35g/kg/day

e) Dyspnea (shortness of breath)

- Eat a diet with fewer carbohydrates and more healthy fat e.g. canola, sunflower, avocado, corn oil (liquid at room temperature) to meet energy requirements for the period when breathing is difficult.
- Eat proteins from a good source like eggs and lean meat in addition to a healthy diet.
- Provide adequate but not excessive nutrients. Avoid over-feeding. If need be, reduce the feeds to 50% of required intake and increase the amount slowly as the patient stabilizes.

f) Fatigue

- Include a source of protein at every meal to sustain energy released from food.
- Limit sweets and sugary food.
- Avoid alcohol and caffeine.
- Eat small frequent meals
- Exercise with caution while considering degree of illness.
- A multiple micronutrient supplement may be considered for patients at risk of vitamin and minerals deficiency or whose intake is inadequate.

g) Other conditions

As pulmonary disease progresses, other related conditions may interfere with food intake or overall nutrition status. These include:

i. Abnormal production of sputum

Increase intake of Fruits and Vegetables like including citrus fruits and leafy vegetables

- Increase intake of warm drinks including clear broth soups, meaning soups without cream or dairy, and warm decaffeinated tea.
- Some foods may cause increased mucus production if you are allergic or intolerant to them. Common food allergens include eggs, fish, milk, nuts, peanuts, shellfish, wheat, soy.
- Avoid any of these foods if they cause allergic reaction.

Some foods naturally contain histamine and their consumption may increase histamine production. Enhanced histamine levels in the body can cause increased production of mucus.

Foods with histamine include processed meats like hot dogs, bacon, vinegar, dried fruits, avocados, tomatoes, spinach, mushrooms, eggplant, cheese, yogurt, sour cream, buttermilk, smoked fish, sardines, alcoholic beverages.

ii. Vomiting

- Eat small frequent nutritious meals.
- Consider intake of dry foods and snacks
- Do not take food together with fluids. Take fluids separately.
- Eat while seated at 45 degrees to 90 degrees and take some time before lying down again.

iii. Anemia

- Increase intake of iron rich foods including green leafy vegetables, meat and vitamin c rich foods such as citrus fruits.
- Consider supplementation depending on severity and cause of anemia.

iv. Fluid retention

- Some patients with fluid retention require sodium and fluid restriction. Depending on the diuretics prescribed, increased dietary intake of potassium may be required.
- The use of parenteral lipids or calorically dense enteral feedings may help meet energy needs.

v. Other Comorbidities

Consider presence of other disease such as cardiovascular or renal disease, cancer, or diabetes mellitus and their specific nutrient requirement during management

vi. Severe Pneumonia and Acute Respiratory Distress

- The goals are to meet basic nutritional requirements, preserve lean body mass, restore respiratory muscle mass and strength, maintain fluid balance, improve resistance to infection, and facilitate weaning from oxygen support and mechanical ventilation by providing energy substrates without exceeding the capacity of the respiratory system to

clear carbon dioxide. Methods to provide nutrition support depend on the underlying disease, whether the patient is acutely or chronically ill, and whether ventilator support is necessary.

- Calculate energy requirements based on nutrition status, physical activity, disease and tolerance. Individualized assessment and interventions are highly encouraged. Calculation for patients' requirements who are normal weight are 1.5 X REE and underweight are 1.7 X REE.
- Provide protein at 1.5-2 g/kg body weight.

2.3 Sepsis

- Minimize catabolism by ensuring adequate intake of nutrients through normal diet, parenteral or enteral nutrition depending on severity of illness.
- Meet energy requirements, but do not overfeed. Provide 25-30 g/kg body weight. Note that caloric requirement for mechanically ventilated or sedated patients may reduce by up to 30%.
- Provide proteins at least 1.5g/kg body weight.
- Meet vitamin and mineral needs
- Establish need and maintain fluid /electrolyte balance.
- Plan nutrition therapy (oral, enteral, and/or parental nutrition)
- In patients with mild and severe sepsis, immune modulating formulae may be harmful and therefore are not recommended.
- Early and progressive Enteral Nutrition should be used in septic patients after hemodynamic stabilization. If contraindicated, Enteral Nutrition should be replaced by progressive Parenteral Nutrition.

2.4 Kidney Failure

- May be acute kidney Injury (AKI) also known as Acute Kidney failure or chronic kidney failure
- Nutritional therapy in these patients should be based on severity of multiple organ failure (MOF) and not on the impairment of renal function
- Essential dietary modifications include energy, protein, potassium, sodium, phosphorus and fluid based on disease stage.
- Undertake initial and periodic nutrition assessment, including evaluation of inflammation, with development of a nutrition care plan.
- Use Standard amino acid parenteral nutrition formulations in acute kidney injury.
- Intradialytic parenteral nutrition (a form of parenteral nutrition administered during regular scheduled dialysis sessions) should not be used as a nutritional supplement in malnourished chronic kidney disease -V hemodialysis patients.
- Patients with renal failure who require nutrition support therapy should receive enteral nutrition if intestinal function permits.

- Individualized assessment and interventions are encouraged.
- Electrolyte intake in patients should be adjusted by monitoring serum concentrations of potassium, Magnesium, Phosphorous, and Calcium
- For patients with acute kidney injury protein intake should be adjusted according to catabolic rate, renal function, and dialysis losses.

Energy:

Acute Kidney Injury and sepsis increase energy needs by up to 30%. For enteral nutrition provide 20-30 kcal/kg/day adopted to individualized needs in case of underweight or obesity.

For parenteral nutrition provide 30 to 35 kcal/kg body weight/days should be administered as carbohydrate and lipid solutions, and the serum concentration of glucose and triglycerides controlled.

Protein:

Acute Kidney Injury (Acute kidney failure)

- Consider high catabolic state. For patients on continuous renal replacement therapy (CRRT) 1.8-2.5g/kg body weight is recommended.
- For patients on hemodialysis provide 1.5g/kg body weight/day and can be increased to 2.5g/kg body weight per day based on need.

Chronic Kidney disease (CKD)

- No renal function - maintenance haemodialysis-1.2g/kg body weight/day
- Continuous ambulatory peritoneal dialysis-1.3g/kg body weight/day
- Stage III or IV CKD (partial renal function)-0.3gms-0.6g/kg body weight/day

Fluid: Balance fluid and electrolyte intake to output. Ideally, fluid and electrolyte intake should balance the net output.

Fluid monitoring to facilitate feeding: last 24hr fluid output at least 500ml if there is no edema or 300ml if edema is present.

Sodium: is restricted, depending on the level of urinary excretion. 2400mg per day (one leveled teaspoon) unless in situation of hyponatremia which should be identified and corrected.

Potassium: Potassium intake needs to be individualized according to serum levels.

Restricted in patients with serum potassium >5.5 mmol/L and on dialysis.

Low potassium foods include mangoes, pineapple, tangerines, apples, pears and lemons. Take maximum 3 servings a day.

High potassium fruits include passion fruit guava, banana, avocado and jackfruit. Limit to one serving a day.

Food preparation methods for potassium reduction required- cutting vegetables, boil in plenty of water for 5 minutes in moderate heat, drain immediately and fry.

Phosphorous

- A normal phosphorus level is 2.5 to 4.5 mg/dl should be maintained. Phosphorous restriction is advised when GFR is less than 29ml/min and patients on dialysis.
- Adopt measures of food preparation methods targeting reduction of dietary phosphorus load.
- Phosphate binders are prescribed and taken with meals and snacks to help control the amount of phosphorus absorbed in the body.
- Minimize intake of high phosphorus foods meat, dairy and offals to one serving per day.
- Have a moderate intake of legumes ad cereals of 2-3 servings a day. Soak legumes overnight and discard the water to reduce phosphorous content.
- Avoid cola beverages, processed meats and cheese.

3.0 NUTRITION MANAGEMENT IN CRITICALLY ILL PATIENTS

3.1 Commonly used terms

Isocaloric diet is an energy administration of around the defined target.

Hypocaloric or underfeeding is an energy administration below 70% of the defined target.

Trophic feeding is a minimal administration of nutrients having beneficial effects, such as preserving intestinal epithelium, stimulating secretion of brush border enzymes, enhancing immune function, preserving epithelial tight cell junctions, and preventing bacterial translocation.

Overfeeding is energy administration of 110% above the defined target.

Low protein diet is protein administration below 0.5 g/kg body weight/day

3.2 General Recommendations

- Consider medical nutrition therapy for all patients staying in the ICU, mainly for more than 48 hours
- General clinical assessment could include report of unintentional weight loss or decrease in physical performance before ICU admission, body composition, muscle mass and strength,
- Oral diet shall be preferred over Enteral Nutrition or Parenteral Nutrition in critically ill patients who are able to eat, and if not possible, initiate early enteral nutrition and if possible within 48 hours.
- In case of contraindications to oral and Enteral Nutrition, Parenteral Nutrition should be initiated within three to seven days

- To avoid overfeeding, early full Enteral Nutrition and Parenteral Nutrition shall not be used in critically ill patients but shall be prescribed within three to seven days.
- Use Continuous rather than bolus Enteral Nutrition
- Gastric access should be used as the standard approach to initiate Enteral Nutrition unless there is gastric feeding intolerance then Consider post pyloric or jejunal feeding.
- Hypocaloric nutrition (not exceeding 70% of Estimated Energy) should be administered in the early phase of acute illness and increased from day 3 to day 7 to 80-100% based on stability and tolerance of the patient.
- Nutrition support should begin as soon as the patient is hemodynamically stable.
- Critically ill patients who are injured, septic, or bedridden may not gain weight, lean body mass, or strength as expected until the source of hyper metabolism is treated or corrected and physical therapy or exercise is begun.
- In unstable and complex ICU patients, particularly in those suffering from liver and renal failure, parenteral glutamine –dipeptide (GNL) shall not be administered
- Antioxidants as high dose monotherapy should not be administered without proven deficiency.
- To enable substrate metabolism, micronutrients (i.e. trace elements and vitamins) should be provided daily with Parenteral Nutrition.
- Enteral Nutrition should be delayed if there is uncontrolled shock, hypoxemia, hypercapnia or acidosis upper GI bleeding, high-output intestinal fistula or gastric residual volume is above 500 ml.
- In non-intubated patients not reaching the energy target with an oral diet, oral nutritional supplements should be considered first and then Enteral Nutrition.
- In non-intubated patients with dysphagia, texture-adapted food can be considered. If swallowing is proven unsafe, Enteral Nutrition should be administered.

Energy

- Critically ill adult patients should receive feedings at rates of 25 to 30 kcal/kg.
- The amount of glucose (PN) or carbohydrates (EN) administered to ICU patients should not exceed 5 mg/kg/min.
- For intravenous lipids the upper recommendation is one (1) g/kg body weight/day with a tolerance up to 1.5 g/kg/day.
- Do not over feed the patient.
- Once stable, energy requirements may be estimated at >30 kcal/kg.
- Parenteral nutrition should be initiated with a low dextrose infusion rate.
- Insulin should be administered to maintain blood glucose levels at desirable levels. In some cases, continuous insulin infusion may be useful.
- Energy requirements for mechanically ventilated and sedated patients may decrease by up to 30 %.

Protein

- For the unstressed adult patient with adequate organ function requiring nutrition support, 0.8 g/kg/day may be adequate.
- Requirements may rise with metabolic demands to levels of about 2 g/kg/day.

Micronutrients

- Micronutrient needs are elevated during acute illness
- Mineral and electrolyte requirements are determined and adjusted individually.

Fluids

- Fluid and electrolytes should be provided to maintain adequate urine output and normal serum electrolytes.
- Adjust based on individual needs.
- Closely monitor blood glucose and electrolytes especially the first week.

4.0 NUTRITION MANAGEMENT FOR PREGNANT AND RECENTLY PREGNANT WOMEN WITH COVID-19

The following should be noted for pregnant women or recently pregnant women

- Asymptomatic transmission of COVID-19 may be possible in pregnant or recently pregnant women, as with the general population. All women with epidemiologic history of contact should be carefully monitored.
- Pregnant women with suspected, probable, or confirmed COVID-19, including women who may need to spend time in isolation, should have access to woman-centered, respectful skilled care, including obstetric, fetal medicine and neonatal care, as well as mental health and psychosocial support, with readiness to care for maternal and neonatal complications.
- All recently pregnant women with COVID-19 or who have recovered from COVID-19 should be provided with information and counselling on safe infant feeding, appropriate infection prevention, and control (IPC) measures to prevent COVID-19 virus transmission.

5.0 FEEDING RECOMMENDATIONS FOR INFANTS BORN TO MOTHERS WITH COVID-19 EXPOSURE

Breastfeeding protects against morbidity and death in the post-neonatal period and throughout infancy and childhood. The protective effect is particularly strong against infectious diseases that are prevented through both direct transfer of antibodies and other anti-infective factors and long-lasting transfer of immunological competence and memory. Therefore, standard infant feeding guidelines should be followed with appropriate precautions for IPC as follows:

- Infants born to mothers with suspected, probable, or confirmed COVID-19 should be fed according to standard infant feeding guidelines, while applying necessary precautions for IPC;
- Breastfeeding should be initiated within 1 hour of birth. Exclusive breastfeeding should continue for 6 months with timely introduction of adequate, safe and properly fed complementary foods at age 6 months, while continuing breastfeeding up to 2 years and beyond;
- Mothers who are not able to initiate breastfeeding during the first hour after delivery should still be supported to breastfeed as soon as they are able. This may be relevant to mothers who deliver by caesarean section or those who have medical instability;
- As with all confirmed or suspected COVID-19 cases, symptomatic mothers who are breastfeeding or practicing skin-to-skin contact or kangaroo mother care should practice respiratory hygiene, including during feeding (for example, use of an N95 mask when near a child if the mother has respiratory symptoms), perform hand hygiene before and after contact with the child, and routinely clean and disinfect surfaces with which the symptomatic mother has been in contact;
- Breastfeeding counseling, basic psychosocial support, and practical feeding support should be provided to all pregnant women and mothers with infants and young children, whether they or their infants and young children have suspected or confirmed COVID-19;
- In situations when severe illness in a mother with COVID-19 or other complications prevents her from caring for her infant or prevents her from continuing direct breastfeeding, mothers should be encouraged and supported to express milk, and safely provide breast milk to the infant, while applying appropriate IPC measures including full personal protective equipment (PPE) for health workers and caregivers;
- In the event that the mother is too unwell to breastfeed or express breast milk, explore the viability of appropriate breast milk substitutes with strict adherence to the Breast Milk Substitute (Regulation and control) Act,2012;
- Mothers and infants should be facilitated to remain together and practice skin-to-skin contact, kangaroo mother care and to practice rooming-in throughout the day and night, especially immediately after birth during establishment of breastfeeding, whether they or their infants have suspected, probable, or confirmed COVID-19; and
- Minimizing disruption to breastfeeding during the stay in the facilities providing isolation services will require health care practices that enable a mother to breastfeed for as much, as frequently, and as long as she wishes. Infants, who may need to be separated from their primary caregivers, should have access to appropriately trained health or non-health personnel.

6.0 GUIDANCE FOR HOSPITAL FEEDING DURING COVID-19

- Develop a contingency plan for feeding patients within the inpatient menu with additional protein, fruits, vegetables and fluids for COVID-19 patients to meet increased needs because of infections.
- Plan for parenteral and enteral nutrition needs using corona virus model of 80% mild to moderate cases, 15% severe, 5% hospitalization, 2%ICU, 1% on ventilators of all infections in your area.
- Secure a designated area for food service, where prepared foods are placed for isolated wards. There should be no contact with the service providers in the isolation ward.
- Consider procurement of disposable utensils, which once used in the isolation wards are disposed. Otherwise, handle reusable utensils and equipment as provided for in the IPC protocol.
- All foods should have patient names and prepared based on individual needs and existing medical conditions packed in a way that the used utensils will be easily disposed.
- Consider the use of information technology including whatsapp and email in communication on patients' dietary needs and other relevant information between kitchen and isolation ward.
- All enteral and parenteral formulations to be handled as pharmaceuticals.
- Nutrition and Dietetics personnel who will be required to review patients to be provided with protective clothing and to practice safety measures as provided for all healthcare providers.

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