

# Clinical Pathway for the Recognition and Management of Undernutrition Among Community Dwelling Adults in Family Practice

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**Background:** Malnutrition is a condition of imbalances in the intake of nutrients and fluids which may translate to poor health outcomes. Based on the Expanded National Nutrition Survey in 2018, eight percent of Filipino adults were found to have chronic energy deficiency (undernutrition), and is most prevalent among the elderly population, residents of the rural area and poorest quintile. Currently, there are no available local guidelines for malnutrition in Filipino adults.

**Objective:** The general objective of this pathway is to improve the quality of health care of the Filipino family through proper recognition and management of malnutrition.

**Method:** The PAFP Nutrition Pathway Working Group reviewed published medical literature to identify, and summarize, the clinical content of clinical indicators, diagnostics, interventions, and outcomes to develop an evidence-based clinical pathway in family practice. The group developed a time-related representation of recommendations on patient-centered processes in terms of history and physical examination, laboratory tests, pharmacologic and non-pharmacologic interventions, as well as family-focused interventions and community strategies to properly recognize and treat adults with malnutrition.

**Recommendations:** During the first visit, all adult patients undergo nutrition assessment through a detailed nutrition focused history taking using the WAFFLES mnemonics and physical examination. Classifying malnutrition risk based on MUST is recommended. The use of SCREEM RES to assess family resources cover biopsychosocial components of malnutrition. The use of laboratory tests to diagnose malnutrition is not recommended. They may be used to guide the nutritional management of patients. For adults recognized to have malnutrition, vitamin and mineral supplements may be prescribed if with actual clinical manifestations or if with known deficiencies. Routine use of appetite stimulants is not recommended, however, underlying cause of loss of appetite should be addressed accordingly. Oral nutritional supplements may be used to augment inadequate treatment. Enteral nutrition may be considered for high malnutrition risk patients with impediments to oral feeding. Education of patient with the PAFP-FNRI Pinggang Pinoy<sup>®</sup> for proper nutrition and hydration is recommended. Food fortification and modification to increase oral intake may be considered. Patients as well as their families must engage in community activities for promotion of good nutrition and must be provided access to resources and assistance as needed. Strength training and resistance exercise to improve muscle strength and body composition is encouraged. Management of malnutrition is based on the malnutrition risk level with these recommendations: If low risk, provide nutrition education; if medium risk, nutrition education plus use of oral nutritional supplements; and if high risk, nutrition education, use of oral nutritional supplements, use of enteral nutrition, referral to a dietitian, appropriate physician and medical facility for parenteral nutrition if warranted. If with impediments to oral feeding or inadequate intake, use of enteral nutrition is to be considered. Patient outcome is reported using the GUIDED and GUIDED-FM mnemonics for first visit and succeeding visits respectively.

Second visit and continuing visit should focus on monitoring the progress towards the therapeutic goals with appropriate modification of intervention and care plan as appropriate. In general practice, nutritional screening should be repeated from <1 month to > 6 months depending on the nutritional risk.

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## FIRST VISIT

**Recommendation 1:** Do nutrition screening and assessment (Strong Recommendation, High Quality Evidence)

Recommendation 1.1. Take a detailed nutrition focused history (Strong Recommendation, High Quality Evidence) using WAFFLES as mnemonics (Strong Recommendation, Low Quality Evidence)

Recommendation 1.2. Get weight, height to compute for Body Mass Index (BMI) (Strong Recommendation, High Quality Evidence)

Recommendation 1.3. Do a nutrition focused physical examination which shall include muscle mass and function (Strong Recommendation, High Quality Evidence), presence or absence of edema (Strong Recommendation, High Quality Evidence), subcutaneous fat changes (Strong Recommendation, High Quality Evidence), and signs of micronutrient deficiencies (Strong Recommendation, Moderate Quality Evidence)

Recommendation 1.4. Use Malnutrition Universal Screening Tool (MUST) to classify patients according to malnutrition risk (Strong Recommendation, Moderate Quality Evidence)

**Recommendation 2:** Use SCREEM RES to assess family resources (Strong Recommendation, Moderate Quality Evidence)

**Recommendation 3:** Routine use of laboratory test to diagnose malnutrition is currently not recommended (Strong Recommendation, Low Quality Evidence)

Recommendation 3.1 Laboratory tests may be used to guide in the nutritional management of patients (Strong Recommendation, Low Quality Evidence)

**Recommendation 4:** Routine use vitamin and mineral supplements is not recommended (Strong Recommendation, Low Quality Evidence)

Recommendation 4.1. Vitamin and mineral supplements may be prescribed for the following (Strong Recommendation, High Quality Evidence):

a. if with actual clinical manifestations of deficiencies,

b. if with known deficiencies.

c. if with conditions at risk for deficiencies

**Recommendation 5:** Routine use of appetite stimulants is not recommended; rather the underlying cause of loss of appetite should be addressed accordingly (Strong Recommendation, Low Quality Evidence)

**Recommendation 6:** Use oral nutritional supplements (ONS) to augment poor or inadequate intake (Strong Recommendation, High Quality Evidence)

Recommendation 6.1. if ONS is not available or is not applicable, use diet fortification as alternative (refer to Recommendation 8.2) (Strong Recommendation, Low Quality Evidence)

**Recommendation 7.** Consider enteral nutrition for malnourished patients with impediments to oral feeding and/or with inadequate oral intake (Strong Recommendation, Moderate Quality Evidence)

**Recommendation 8:** Give nutrition education (Strong Recommendation, High Quality Evidence)

Recommendation 8.1 Educate the patient and the family using the PAFP-FNRI Pinggang Pinoy® for proper nutrition and hydration (Strong Recommendation, Low Quality Evidence)

Recommendation 8.2. Use food fortification and modification as other strategies to increase oral intake (Moderate Recommendation, Low Quality Evidence)

Recommendation 8.3. Encourage the patient and the family to engage in community activities for promotion of good nutrition and to avail of available resources for assistance if needed. (Strong Recommendation, High Quality Evidence)

Recommendation 8.4. Make meals a social activity i.e., eating with family or companion (Strong Recommendation, High Quality Evidence)

Recommendation 8.5. Advise strength training/ resistance exercise to improve muscle strength and body composition (Strong Recommendation, Moderate Quality Evidence)

**Recommendation 9:** Refer to appropriate professional or institution: (Strong Recommendation, High Quality Evidence)

Recommendation 9.1 Refer to dietitian or nutritionist for detailed and individualized diet counselling if warranted (Strong Recommendation, High Quality Evidence)

Recommendation 9.2 Refer to appropriate physician specialists if the undernutrition is secondary to a medical, surgical pathology or to serious co-morbidities. (Strong Recommendation, High Quality Evidence)

Recommendation 9.3 Refer to a medical facility, nutrition team, or trained homecare team if parenteral nutrition is warranted (Strong Recommendation, Low Quality Evidence)

**Recommendation 10.** Manage malnutrition risk based on MUST (Moderate Recommendation, Low Quality Evidence)

Recommendation 10.1. If low risk, follow recommendation 7 and 8 (Moderate Recommendation, Low Quality Evidence)

Recommendation 10.2. If medium risk, follow recommendation 6, 7 and 8 (Moderate Recommendation, Low Quality Evidence)

Recommendation 10.3. If high risk, follow recommendation 6, 7, 8 and 9 (Moderate Recommendation, Low Quality Evidence)

**Recommendation 11:** Use GUIDED as mnemonics for reporting patient outcomes (Strong Recommendation, Low Quality Evidence)

## SECOND AND SUCCEEDING VISITS

**Recommendation 1.** Do nutrition Re-screening and Re-assessment: (Strong Recommendation, low quality evidence)

Recommendation 1.1. Ask about the effect of intervention (pharmacologic and non-pharmacologic) (Strong Recommendation Low Quality Evidence)

Recommendation 1.2. Get results of monitoring (weight, food and exercise) (Strong Recommendation Low Quality Evidence)

Recommendation 1.3. Ask about changes in Food pattern and preferences of the family (Strong Recommendation, Low Quality Evidence)

Recommendation 1.4. Ask about participation to available resources in relation to nutrition (Strong Recommendation Low Quality Evidence)

Recommendation 1.5. Get weight, height to compute for Body Mass Index (BMI) (Strong Recommendation, High Quality Evidence)

Recommendation 1.6. Do a nutrition focused physical examination which shall include muscle mass and function (Strong Recommendation, High Quality Evidence), presence or absence of edema (Strong Recommendation, High Quality Evidence), subcutaneous fat changes (Strong Recommendation, High Quality Evidence), and signs of micronutrient deficiencies (Strong Recommendation, Moderate Quality Evidence)

Recommendation 1.7. Use Malnutrition Universal Screening Tool (MUST) to classify patients according to malnutrition risk (Strong Recommendation, Moderate Quality Evidence)

**Recommendation 2:** Use SCREEM RES to assess family resources (Strong Recommendation, Moderate Quality Evidence)

**Recommendation 3:** Routine use of laboratory test to diagnose malnutrition is currently not recommended (Strong Recommendation, Low Quality Evidence)

Recommendation 3.1 Laboratory tests may be used to guide in the nutritional management of patients (Strong Recommendation, Low Quality Evidence)

**Recommendation 4:** Routine use vitamin and mineral supplements is not recommended (Strong Recommendation, Low Quality Evidence)

Recommendation 4.1. Vitamin and mineral supplements may be prescribed for the following (Strong Recommendation, High Quality Evidence):

a. if with actual clinical manifestations of deficiencies,

b. if with known deficiencies.

c. if with conditions at risk for deficiencies

**Recommendation 5:** Routine use of appetite stimulants is not recommended; rather the underlying cause of loss of appetite should be addressed accordingly (Strong Recommendation, Low Quality Evidence)

**Recommendation 6:** Use oral nutritional supplements (ONS) to augment poor or inadequate intake (Strong Recommendation, High Quality Evidence)

Recommendation 6.1. If ONS is not available or is not applicable, use diet fortification as alternative (refer to Recommendation 8.2) (Strong Recommendation, Low Quality Evidence)

**Recommendation 7.** Consider enteral nutrition for malnourished patients with impediments to oral feeding and/or with inadequate oral intake (Strong Recommendation, Moderate Quality Evidence)

**Recommendation 8:** Give nutrition education (Strong Recommendation, High Quality Evidence)

Recommendation 8.1 Educate the patient and the family using the PAFP-FNRI Pinggang Pinoy® for proper nutrition and hydration (Strong Recommendation, Low Quality Evidence)

Recommendation 8.2. Use food fortification and modification as other strategies to increase oral intake (Moderate Recommendation, Low Quality Evidence)

Recommendation 8.3. Encourage the patient and the family to engage in community activities for promotion of good nutrition and to avail of available resources for assistance if needed. (Strong Recommendation, High Quality Evidence)

Recommendation 8.4. Make meals a social activity i.e., eating with family or companion (Strong Recommendation, High Quality Evidence)

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**Recommendation 10.** Manage malnutrition risk based on MUST (Moderate Recommendation, Low Quality Evidence)

Recommendation 10.1. If low risk, follow recommendation 7 and 8 (Moderate Recommendation, Low Quality Evidence)

Recommendation 10.2. If medium risk, follow recommendation 6,7 and 8 (Moderate Recommendation, Low Quality Evidence)

Recommendation 10.3. If high risk, follow recommendation 6,7,8 and 9 (Moderate Recommendation, Low Quality Evidence)

**Recommendation 11:** Use GUIDED-FM as mnemonics for reporting patient outcomes (Strong Recommendation, Low Quality Evidence)

### **Implementation:**

Education, training, and audit are recommended strategies to implement the clinical pathway.

## **INTRODUCTION**

Malnutrition is a condition with imbalances in the intake of nutrients and fluids. It encompasses undernutrition and overnutrition, reflecting the quality and quantity of macronutrients and micronutrients in the diet, as well as the impact of disease and aging on nutritional status. Consequently, physical, and physiological abnormalities may ensue causing a decline in function, quality of life, and higher mortality risk. From a societal perspective, malnutrition also increases health care costs, reduces productivity, and slows economic growth. This perpetuates poverty and poor health, especially in lower- and middle-income countries.<sup>1</sup>

Although malnutrition encompasses both undernutrition and overnutrition, this clinical pathway will use the term “malnutrition” interchangeably with “undernutrition”.

Based on the 2018 Expanded National Nutrition Survey<sup>2</sup>, chronic energy deficiency (undernutrition) among Filipino adults was 8.0%. This was most prevalent among the elderly aged 70 years old and above (18.2%), those residing in rural areas (9.5%) and those belonging to the poorest quintile (13.4%).

A key step in addressing malnutrition is the identification of populations at risk of malnutrition using validated tools or health parameters.<sup>3,4</sup> The clinician will then be able to perform further nutrition assessment and develop an appropriate and tailor-fit nutrition management for patients and their families.

Because malnutrition is often overlooked and underdiagnosed and therefore left untreated, the working group developed this clinical pathway as a guide for family physicians to address undernutrition among community-dwelling Filipino adults.

### **Scope and Purpose**

This Clinical Pathway covers community-dwelling and clinic-based Filipino adults that are 18 years and above and are diagnosed to have Undernutrition or are At Risk of Malnutrition based on the Malnutrition Universal Screening Tool (MUST).

### **Patients included are those with any of the following:**

- BMI of <18.5
- History of decline in nutritional intake
- History of unintentional weight loss

This is intended to guide family physicians on how to screen and assess for malnutrition and its risk, manage malnutrition using both pharmacologic and non-pharmacologic interventions, using a patient-centered, family-focused, community-oriented care approach. The referral to a medical facility or to other physician specialists is part of the recommendations as this pathway is limited to the out-patient or community setting. This pathway does not include assessment and management of overweight and obese adult patients.

### **Objectives**

The general objective of this clinical pathway is to improve outcomes of malnourished patients in family and community practice through proper recognition and management of malnutrition.

### **Specific Objectives:**

1. To assist Filipino family physicians in the diagnosis and management of undernutrition in adult patients, in terms of:
  - Clinical history and physical examination
  - Laboratory and ancillary procedures to be requested
  - Pharmacologic intervention
  - Non-pharmacologic interventions
  - Patient outcomes
2. To standardize the quality of care among the members of the Philippine Academy of Family Physicians (PAFP) in the early recognition of malnutrition and appropriate management.
3. To promote quality improvement initiatives at the clinic and organizational level.

## **Methods of Development and Implementation**

### **Development Team**

The Nutrition Pathway Working Group was organized by the Quality Assurance head of the PAFP. The team is composed of fellows and diplomates of the PAFP who are interested in nutrition. Five of them are fellows of the Philippine College of Medical Nutrition Physicians (PCMNP), which is one of the specialty societies of the PAFP. The

others have special interest in nutrition and are affiliated to a training institution. All have declared their conflict of interest. The clinical pathway was written independently and was not influenced by any pharmaceutical or nutrition companies.

### Formulating the Scope and Review Questions

The scope was limited to the recognition and management of undernutrition among adults aged 18 years old and above who are free living in the community setting. These were the formulated clinical questions for the PAFP pathway task matrix:

#### History and physical examination

- What are the usual manifestations of malnutrition/ undernutrition in adults? Are only underweight adult patients suspected of malnutrition?
- What are the factors that contribute to malnutrition in adults?
- How is malnutrition screened or detected in adults?

#### Laboratory

- How is malnutrition diagnosed in adults?
- Is there a diagnostic work-up for malnutrition in adult patients?

#### Pharmacological

- Should oral nutritional supplements be indicated for patients with malnutrition?
- Are appetite stimulants effective in the management of undernutrition patients?
- Should vitamin supplementation be routinely done to patients with malnutrition? -
- In older adults, should vitamins be prescribed if patients are already eating a balanced meal?

#### Non-pharmacological

- What is a balanced diet for adults and older adults?
- Is there a special diet advise for patients with malnutrition?
- Is Pinggang Pinoy® acceptable in these patents with malnutrition?
- Is there a role for exercise in patients with malnutrition?
- When do we refer patients with malnutrition to specialists?
- What are effective preventive strategies for malnutrition in adult patients and their families?
- Are there government programs that sustain or cover adult malnutrition?

#### Outcomes:

- What are the expected outcomes?
  - Understood the illness, complications, treatment.
  - Awareness on the side effect of oral nutritional supplements
  - Weight gain
  - Increase in appetite.
  - Improved muscle mass, strength, and function
  - Quality of life
- How do we reassess or monitor nutrition status in adult patients with malnutrition? How often?

### Searching, Selecting and Appraising the Evidence

The key words (adult OR older adult) AND (malnutrition OR undernutrition) AND (primary care OR community) AND “guidelines” were the search terms used. The filters and the applied limitations in the search ensured that only relevant, updated published articles, studies and guidelines, in full text and in English language, specific in the conduct of selecting the best evidence were included. PubMed, HERDIN plus and Google Scholar were the online portals used in the search. The exhaustive literature search on the available evidence led to the inclusion of several studies and guidelines to which the ADAPTE process was utilized for appraisal. The clinical questions on SCREEM-RES, diagnostic tool, appetite stimulants, vitamin supplementation, Pinggang Pinoy®, family meals and exercise were not addressed in the guidelines, hence, the formation of the de-novo recommendations built upon the best available evidence. From the retrieved articles, majority included older adults as the population rather than adults in general.

### Formulating the Recommendation

Recommendations were formulated based on the clinical questions and evidence gathered. These were presented to the technical advisor from the PAFP research committee representative and to the PAFP Quality Assurance Head for comments and suggestions and were revised accordingly. They served as external reviewers. Eleven (11) main recommendations with sub-recommendations for recommendations 1, 3, 4, 6, 8, 9 and 10 constituted the final recommendations.

### Grading of the Recommendations

Evidence grade level for the appraised guidelines was based on the agreements of the working group in the interpretation of the results of the AGREE II tool. The grading of the evidence for the studies supporting the de-novo recommendations was adapted from the table of evidence grade level table from the previously published PAFP clinical pathway (Table 1).

**Table 1.** Grading of the Evidence for De-Novo Recommendations

Evidence Grade	Interpretation
Strong Quality Evidence	The best evidence cited to support the recommendation is a well-conducted randomized controlled trial
Moderate Quality Evidence	The best evidence cited to support the recommendation is a well-conducted observational study i.e., match control or before and after clinical trial, cohort studies, case control studies and cross-sectional studies
Low Quality Evidence	The best evidence cited to support the recommendation is based on expert opinion or observational study that did not meet the criteria for moderate quality evidence

The working group presented the recommendations with the corresponding evidence grade levels to the Consensus Panel composed

of five (5) PAFP members from the different chapters of NCR, north Luzon, south Luzon, Visayas and Mindanao. The panel was given two (2) weeks to make their initial vote using the evidence to decision matrix. The panel met for 3 ½ hours to make the final voting for each of the recommendations. The panel grading guide is shown in Table 2. All the panel members accomplished the evidence to decision matrix and signed the conflict-of-interest forms.

The recommendations were presented in the clinical pathway matrix (Tables 3 & 4) and in two algorithm formats A and B (Figures 1 & 2). This was intended to facilitate the use of the pathway.

**Table 2.** Grading of the recommendations

Panel Grade	Interpretation
Strong recommendation	All panel members voted to adopt the recommendation (5 out of 5)
Moderate recommendation	At least 80% but not all voted to adopt the recommendation (4 out of 5)
Weak recommendation	At least 60-79% voted to adopt the recommendation (3 out of 5)

**Table 3.** Pathway recommendations for first visit

Visit	Pathway Tasks				Patient Outcomes
	History and Physical Examination	Laboratory	Pharmacologic Intervention	Non-pharmacologic Interventions	
First Visit	<p>___1: Do nutrition screening and assessment</p> <p>___1.1. Take a detailed nutrition focused history using WAFFLES as mnemonics</p> <p>W-eight loss or weight gain</p> <p>A-ppetite</p> <p>F-ood intake (usual food intake/ food preferences) and fad diet</p> <p>F-ecal (bowel movement/ GI symptoms)</p> <p>L-iving and working conditions and activities of daily living (dependent or independent)</p> <p>E-ating difficulties (dysphagia/ poor dentition) and eating disorders</p> <p>S-upplements and medications</p> <p>___1.2. Get weight, height to compute for Body Mass Index (BMI)</p> <p>___1.3. Do a nutrition focused physical examination which shall include muscle mass and function), presence or absence of edema, subcutaneous fat changes, and signs of micronutrient deficiencies</p> <p>___1.4. Use Malnutrition Universal Screening Tool (MUST) to classify patients according to malnutrition risk</p> <p>___2. Use SCREEM RES to assess family resources</p>	<p>___3. Routine use of laboratory test to diagnose malnutrition is currently not recommended</p> <p>___3.1. Laboratory tests may be used to guide in the nutritional management of patients</p>	<p>___4. Routine use vitamin and mineral supplements is not recommended</p> <p>___4.1. Vitamin and mineral supplements may be prescribed for the following:</p> <p>a. if with actual clinical manifestations of deficiencies,</p> <p>b. if with known deficiencies.</p> <p>c. if with conditions at risk for deficiencies</p> <p>___5. Routine use of appetite stimulants is not recommended; rather the underlying cause of loss of appetite should be addressed accordingly</p> <p>___6. Use oral nutritional supplements (ONS) to augment poor or inadequate intake</p> <p>___6.1. if ONS is not available or is not applicable, use diet fortification as alternative (refer to recommendation 8.2)</p> <p>___7. Consider enteral nutrition for malnourished patients with impediments to oral feeding and/or with inadequate oral intake</p>	<p>___8. Give nutrition education</p> <p>___8.1. Educate the patient and the family using the PAFP-FNRI Pinggang Pinoy® for proper nutrition and hydration</p> <p>___8.2. Use food fortification and modification as other strategies to increase oral intake</p> <p>___8.3. Encourage the patient and the family to engage in community activities for promotion of good nutrition and to avail of available resources for assistance if needed.</p> <p>___8.4. Make meals a social activity i.e. eating with family or companion</p> <p>___8.5. Advise strength training/ resistance exercise to improve muscle strength and body composition</p> <p>___9. Refer to appropriate professional or institution:</p> <p>___9.1. Refer to dietitian or nutritionist for detailed and individualized diet counselling if warranted</p> <p>___9.2. refer to appropriate physician specialists if the undernutrition is secondary to a medical, surgical pathology or to serious co-morbidities.</p> <p>___9.3. refer to a medical facility, nutrition team , or trained homecare team if parenteral nutrition is warranted</p>	<p>___11. Use GUIDED as mnemonics for reporting patient outcomes</p> <p>G-ained awareness of nature of weight loss/gain</p> <p>U-nderstood the drug/ONS prescribed, dose and potential side effects</p> <p>I-identified the risks associated with the current condition</p> <p>D-etermined the possible resources for the resolution of condition</p> <p>E-ducated on the importance of nutrition and lifestyle change</p> <p>D-o the recommended diagnostic work-up and return visit</p>
Variation		<p>___Request for specific laboratory tests to rule out other causes of undernutrition</p>	<p>___10. Manage malnutrition risk based on MUST</p> <p>___10.1 if low risk, follow recommendation 7 and 8</p> <p>___10.2 if medium risk, follow recommendation 6,7 and 8</p> <p>___10.3 if high risk, follow recommendation 6, 7, 8 and 9</p>		



**Table 4.** Pathway recommendations for second and succeeding visits

Visit	Pathway Tasks				Patient Outcomes
	History and Physical Examination	Laboratory	Pharmacologic Intervention	Non-pharmacologic Interventions	
Second and Succeeding Visits	<p>__1. Do nutrition Re-screening and Re-assessment:</p> <p>__1.1. Ask about the effect of intervention (pharmacologic and non-pharmacologic)</p> <p>__1.2. Get results of monitoring (weight, food and exercise)</p> <p>__1.3. Ask about changes in Food pattern and preferences of the family</p> <p>__1.4. Ask about participation to available resources in relation to nutrition</p> <p>__1.5. Get weight, height to compute for Body Mass Index (BMI)</p> <p>__1.6. Do a nutrition focused physical examination which shall include muscle mass and function, presence or absence of edema, subcutaneous fat changes, and signs of micronutrient deficiencies</p> <p>__1.7. Use Malnutrition Universal Screening Tool (MUST) to classify patients according to malnutrition risk</p> <p>2. Use SCREEM RES to assess family resources</p>	<p>3. Routine use of laboratory test to diagnose malnutrition is currently not recommended</p> <p>3.1. Laboratory tests may be used to guide in the nutritional management of patients</p>	<p>__4. Routine use vitamin and mineral supplements is not recommended</p> <p>__4.1. Vitamin and mineral supplements may be prescribed for the following:</p> <p>a. if with actual clinical manifestations of deficiencies,</p> <p>b. if with known deficiencies.</p> <p>c. if with conditions at risk for deficiencies</p> <p>__5. Routine use of appetite stimulants is not recommended; rather the underlying cause of loss of appetite should be addressed accordingly</p> <p>__6. Use oral nutritional supplements (ONS) to augment poor or inadequate intake</p> <p>__6.1. if ONS is not available or is not applicable, use diet fortification as alternative (refer to recommendation 8.2)</p> <p>__7. Consider enteral nutrition for malnourished patients with impediments to oral feeding and/or with inadequate oral intake</p>	<p>__8. Give nutrition education</p> <p>__8.1. Educate the patient and the family using the PAFP-FNRI Pinggang Pinoy® for proper nutrition and hydration</p> <p>__8.2. Use food fortification and modification as other strategies to increase oral intake</p> <p>__8.3. Encourage the patient and the family to engage in community activities for promotion of good nutrition and to avail of available resources for assistance if needed.</p> <p>__8.4. Make meals a social activity i.e.. eating with family or companion</p> <p>__8.5. Advise strength training/ resistance exercise to improve muscle strength and body composition</p> <p>__9. Refer to appropriate professional or institution:</p> <p>__9.1. Refer to dietitian or nutritionist for detailed and individualized diet counselling if warranted</p> <p>__9.2. refer to appropriate physician specialists if the undernutrition is secondary to a medical, surgical pathology or to serious co-morbidities.</p> <p>__9.3. refer to a medical facility, nutrition team , or trained homecare team if parenteral nutrition is warranted</p>	<p>__11. Use GUIDED-FM as mnemonics for reporting patient outcomes</p> <p>G-ained awareness of nature of weight loss/gain</p> <p>U-nderstood the drug/ONS prescribed, dose and potential side effects</p> <p>I-identified the risks associated with the current condition</p> <p>D-etermined the possible resources for the resolution of condition</p> <p>E-ducated on the importance of nutrition and lifestyle change</p> <p>D-o the recommended diagnostic work-up and return visit</p> <p>F-ormulated action plan with the family / Compliance</p> <p>M-onitored clinical parameters; MUST score</p>
Variation		<p>__Correlate results of requested labs to clinical features and address accordingly</p> <p>Request additional labs if necessary</p>	<p>__10. Manage malnutrition risk based on MUST</p> <p>__10.1 if low risk, follow recommendation 7 and 8</p> <p>__10.2 if medium risk, follow recommendation 6,7 and 8</p> <p>__10.3 if high risk, follow recommendation 6, 7, 8 and 9</p>		

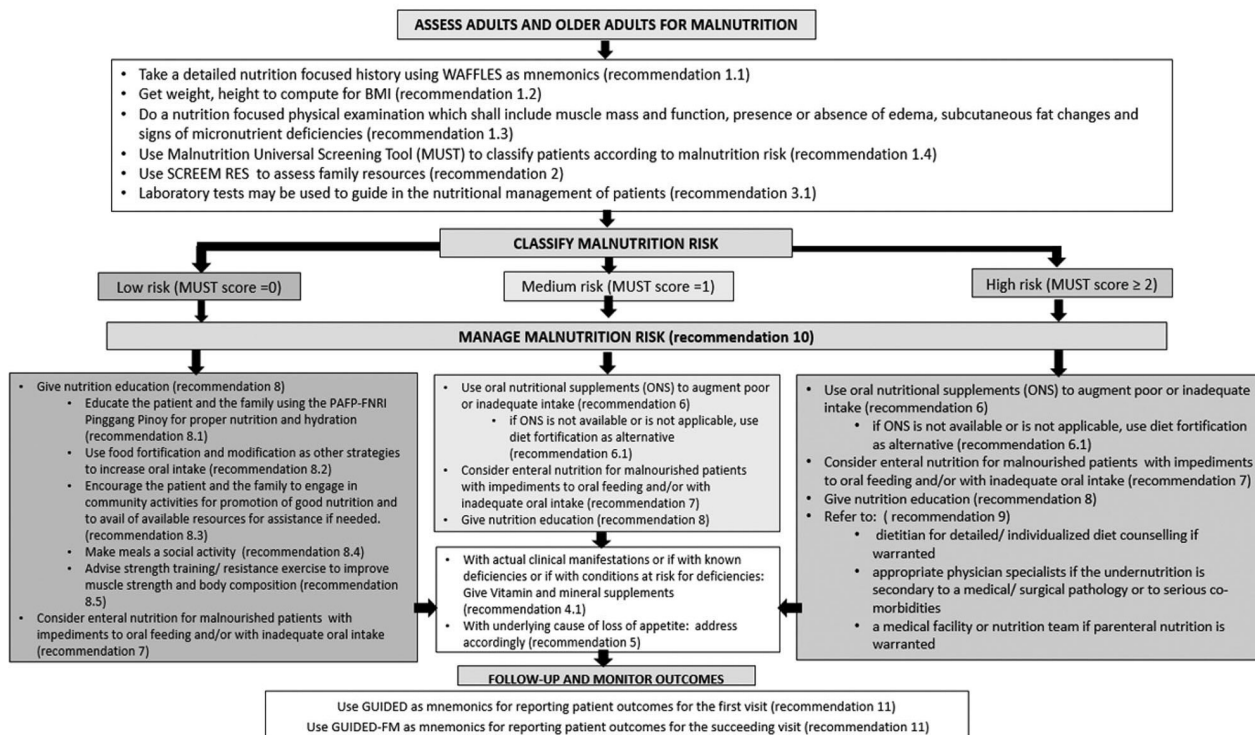


Figure 1. Pathway algorithm (A): Algorithm for the recognition and management of adult and older adult malnutrition.

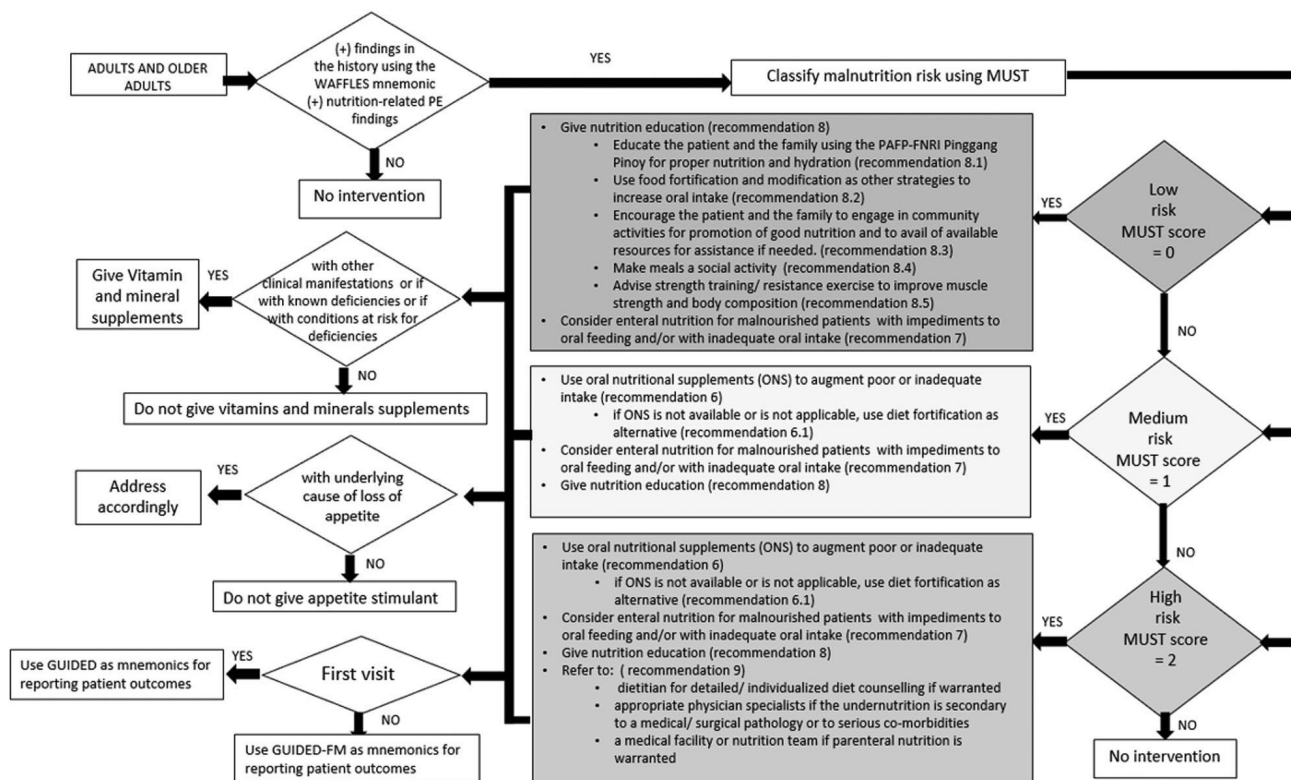


Figure 2. Pathway algorithm (B): Algorithm for the recognition and management of adult and older adult malnutrition.



## Recommendations

### First Visit

#### History and Physical Examination

**Recommendation 1:** Do nutrition screening and assessment (Strong Recommendation, High Quality Evidence)

**Recommendation 1.1.** Take a detailed nutrition focused history (Strong Recommendation, High Quality Evidence) using WAFFLES as mnemonics (Strong Recommendation, Low Quality Evidence)

The “WAFFLES” mnemonic is a guide crafted by the working group for nutrition focused history taking. “WAFFLES” stands for the following:

- W - weight loss or weight gain
- A - appetite
- F - food intake (usual food intake/ food preferences) and food diet
- F - fecal (bowel movement/ GI symptoms)
- L - living and working conditions and activities of daily living (dependent or independent)
- E - eating difficulties (dysphagia/ poor dentition) and eating disorders
- S - supplements and medications

These are included in the assessment part of the guidelines for addressing malnutrition among adults and older adults.<sup>5-13</sup>

The items in the mnemonic such as weight loss (W), anorexia (A), food intake (F), gastrointestinal symptoms (F), functional capacity (L), dysphagia (E) are among the criteria used in the various validated nutrition screening and assessment tools.<sup>3,14,15,16</sup> Among the validated tools, only the MUST is a tool for screening for both undernutrition and overnutrition among adults in the community setting.<sup>5</sup> Unintentional weight loss (W), food intake problems (F) and BMI are among the parameters included in the MUST nutrition screening tool.<sup>5</sup> The use of medications/ supplements (S) should also be included in the history taking as these affect appetite, oral intake, and weight.<sup>17</sup> History should include an assessment of the general socio-cultural determinants, living and working conditions, environment and sanitation that may affect the patient’s nutritional status.<sup>18,19</sup>

**Recommendation 1.2.** Get weight, height to compute for Body Mass Index (BMI) (Strong Recommendation, High Quality Evidence)

Measuring the height and weight are part of the physical examination of the patient. They are also used to compute for the Body Mass Index (BMI), that provides some indication as to an individual’s nutritional status. BMI is also an indirect measurement of body fat. BMI is a tool for nutrition screening and assessment utilized in the different guidelines<sup>6-13</sup>:

It is computed as:

weight (kg) / [height (m)]<sup>2</sup> or weight (lb.) / [height (in)]<sup>2</sup> x 703

**Table 5.** Classification of weight by BMI:

Classification	BMI (kg/m <sup>2</sup> ) in Adult Europids (WHO 1998)	BMI (kg/m <sup>2</sup> ) (World Health Organization Regional Office for the Western Pacific (WPRO 2000))
Underweight	< 18.5	< 18.5
Normal	18.5 – 24.9	18.5 – 22.9
Overweight	25 – 29.9	23 – 24.9
Obese I	30 – 34.9	25 – 29.9
Obese II	35 – 39.9	≥ 30
Obese III	≥ 40	

The Asia-Pacific Perspective: Redefining Obesity and its Treatment published in 2000 is a joint project of the WHO – Western Pacific Region, International Association for the study of Obesity and the International Task Force on Obesity to provide a regional emphasis on the importance of obesity and its treatment.<sup>20</sup> Lower BMI cut offs for overweight, and obesity were recommended based on the findings that Asians tend to develop intra-abdominal fat without developing generalized obesity and that morbidity and mortality are occurring at lower BMI levels, hence the Asia-Pacific BMI cut offs (WPRO 2000) will be utilized in our malnutrition pathway.

**Recommendation 1.3.** Do a nutrition focused physical examination which shall include muscle mass and function (Strong Recommendation, High Quality Evidence), presence or absence of edema (Strong Recommendation, High Quality Evidence), subcutaneous fat changes (Strong Recommendation, High Quality Evidence), and signs of micronutrient deficiencies (Strong Recommendation, Moderate Quality Evidence)

Nutrition-focused physical examination is the evaluation of changes in body composition and function that may be brought about by malnutrition. It is a head-to-toe approach that examines muscle mass, fat mass, presence of edema, functional capacity, and micronutrient deficiencies.<sup>21</sup>

Nutrition screening and assessment tools, such as the Malnutrition Universal Screening Tool (MUST) utilizes the BMI to identify patients who are malnourished or those who are at risk for malnutrition and consequently take appropriate action to ensure adequate nutrition. However, BMI has some limitations<sup>22</sup>:

1. BMI is a surrogate measure of body fat, it is a measure of excess/ deficient weight rather than body fat.

2. BMI does not distinguish between excess fat, muscle or bone mass.
3. BMI does not indicate the distribution of fat mass.

For these reasons, measurement of calf circumference to determine the absence or presence of reduced muscle mass and a nutrition focused physical examination must be performed.

Measurement of calf circumference:

Measure the maximal calf circumference of the right leg. While the patient is sitting, place the tape measure around the calf and move it up and down to locate the maximal circumference. Reduced muscle mass is considered when the measurement is < 33 cm for males and < 32 cm for females.<sup>23, 24</sup>

1. Muscle mass changes may be identified by examining and palpating areas such as the clavicles, deltoids and quadriceps. In general, the bones are not prominent and the muscle is formed and may be bulging. With malnutrition, the clavicles may be moderately prominent or very visible. The shoulder blades become evident as the deltoid muscle diminishes. The quadriceps may have prominent concave shape between the thighs and lacks definition.<sup>22</sup>

2. Examine the orbital area, iliac crest and the triceps to evaluate adiposity. Normally the bones are not prominent and adequate tissue is noted during palpation. In patients who are malnourished one may observe that the orbital area is concave with dark circles visible around the eyes and the skin is loose. Gentle pinch of the skinfold in the triceps area will reveal the presence of some fat tissue when the finger tips are closer together or the absence of fat tissues when finger tips are touching. There is also protrusion of the iliac crest.<sup>21</sup>

3. Edema may be a factor in the evaluation of weight fluctuations. Palpate the area of over the tibial bone or ankle. The depression may be barely noticeable to very pronounced that the rebound takes a long time to occur.<sup>21, 22</sup>

Aging brings about changes in body composition, there is decrease in lean body mass and increase in fat mass, these changes may be masked by stable body weight. Several nutritional guidelines such as the GLIM, and nutritional organizations such as ASPEN and ESPEN recommend assessment of muscle mass and fat mass.<sup>3, 9, 25</sup> As a supportive measure the use of hand grip may also be used to assess muscle function.<sup>8, 12, 26</sup> Change in adiposity and muscle mass coupled with the presence of edema reflect changes in the nutritional status in adults with malnutrition or those at risk of malnutrition.<sup>6, 8, 9, 12</sup>

Muscle mass changes may be identified by examining and palpating the following areas:<sup>22</sup>

Physical Examination	Normal	Muscle mass loss
Temple	well-defined muscle	hollowed, depressed
Clavicle	males: not visible females: visible but not prominent	Protruding/prominent bone
Shoulders	rounded	prominent bones
Scapula/ribs	no prominent bones no depressions	prominent bones mild to significant depression
Quadriceps	well-defined	prominent knee depression medially
Interosseous muscle between thumb and finger	muscle protrudes could be flat in females	flat or depressed areas

To evaluate adiposity, the following areas may be examined:<sup>21</sup>

Physical Examination	Normal	Subcutaneous fat loss
Under the eyes	slightly bulging	hollowed look depressed dark circles
Triceps	large space between fingers upon pinching	loose fitting skin
Ribs	chest is full	indentations between ribs
Lower back	ribs do not show	are obvious
Sides of trunk	slight to no protrusion of the iliac crest	very prominent iliac crest

Edema may be a factor in the evaluation of weight fluctuations, check the following areas for the presence or absence of edema: <sup>21,22</sup>

Physical Examination	Presence of Edema
Tibial bone or ankle	depression barely noticeable to very pronounced that the rebound takes a long time to occur

**Recommendation 1.4.** Use Malnutrition Universal Screening Tool (MUST) to classify patients according to malnutrition risk (Strong Recommendation, Moderate Quality Evidence)

The Malnutrition Universal Screening Tool (MUST) is a validated screening tool for different groups of adults in different health care settings which categorizes patients as to the degree of risk of malnutrition.<sup>5,27</sup> The risk score of 2-6 classifies patients as high risk, 1 as medium risk and 0 as low risk.<sup>5,27</sup> In terms of predictive validity, the MUST predicts the rates of hospitalization and general practitioner visits at the community setting.<sup>5</sup> The MUST also showed that outcome is improved with appropriate intervention.<sup>5</sup> The working group adapted the MUST because its risk classification coincides with a nutrition management plan, and this is the tool recommended by various guidelines to be used in the community setting.<sup>7,10,11</sup> The MUST flowchart<sup>27</sup> was reformatted into a table for the parameters for risk screening with the guide for interpretation of scores (see Table 5) while the management guideline part of the flow chart was modified and placed under the non-pharmacologic and pharmacologic intervention column as recommendation 10. The table included the formula for BMI and % weight loss as guide for the user (see Table 6). Copyright permission for the use of the MUST was granted by the British Association of Parenteral and Enteral Nutrition (BAPEN) on August 30, 2022.

**Recommendation 2:** Use SCREEM RES to assess family resources (Strong Recommendation, Moderate Quality Evidence)

Malnutrition in older adults is a complex multifactorial process with lifestyle, financial, social, and psychological factors, as well as presence of disease and medication use, all contributing to this pathological state.<sup>28</sup> Malnutrition and malnutrition risk could be reduced in the elderly by increasing their economic level, supporting those living alone or who are single, widowed, or divorced, and improving lifelong learning.<sup>29</sup> In one study it was mentioned that the risk for malnutrition was associated with lower level of education and lower cognitive performance.<sup>30</sup> These contributing factors in malnutrition among the older people should be assessed and an important tool called SCREEM-RES can be utilized. This instrument is a brief 12 item questionnaire which includes all the six original SCREEM domains and contains 2 items per domain. The tool focuses on the family resources that can be used by the family to cope with difficult situations; these include social, cultural, religious, economic, and medical resources. This tool developed by Dr. Manuel Medina, Jr. and the Section of Supportive Hospice and Palliative Medicine, University of the Philippines – Philippine General Hospital (SHPM, UP-PGH), can be a reliable measure of family resources, the adequacy of which may mean capacity for health care provision.<sup>31</sup> The older people or the caregiver may provide their perception of the adequacy of the family’s resources which can be the underlying cause of malnutrition.

**Table 6.** Malnutrition Universal Screening Tool (MUST)

Malnutrition Universal Screening Tool (MUST)		
The use of the MUST is with the kind permission of BAPEN (British Association for Parenteral and Enteral Nutrition). For further information on ‘MUST’ see <a href="http://www.bapen.org.uk">www.bapen.org.uk</a> Copyright © BAPEN 2012		
Parameters		Score
Body Mass Index (BMI)	> 20	0
BMI= weight in Kg/ (height in m) <sup>2</sup>	18.5-20	1
	< 18.5	2
% Unplanned weight loss in past 3-6 months	< 5%	0
% Weight loss = (usual weight – actual weight)/ usual weight x 100%	5 - 10%	1
	> 10%	2
Acute disease effect	No	0
If patient is acutely ill and there has been or is likely to be no nutritional intake for >5 days	Yes	2
Malnutrition Risk: LOW Risk: Total Score of 0 MEDIUM Risk: Total Score of 1 HIGH Risk: Total Score of 2 or more		

**Table 7. SCREEM-RES Tool**

SCREEM FAMILY RESOURCES SURVEY (SCREEM-RES)					
When someone in our family gets sick . . .		Strongly agree (3)	Agree (2)	Disagree (1)	Strongly disagree (0)
S1	We help each other in our family				
S2	Our friends and people in our community are helpful to our family				
C1	Our culture gives our family strength and courage				
C2	Our culture of helpfulness, caring and concern in our community is helpful to our family				
R1	Our faith and religion are helpful to our family				
R2	Members of our church and/or religious groups are helpful to our family				
E1	Our family's savings are sufficient for our needs				
E2	Our family's income is sufficient for our needs				
E1	Our knowledge and education are sufficient for us to understand the information about the illness				
E2	Our knowledge and education are sufficient for us to take care of our sick family member				
M1	Medical help is readily available in our community				
M2	Doctors, nurses and/or health workers in our community are helpful to our family				
Total Score					
SCREEM-RES SCORING					
Domain		Domain subscales			
0-12	Severely Inadequate Family Resources	0-2	Severely Inadequate Family Resources		
13-24	Moderately Inadequate Family Resources	3-4	Moderately Inadequate Family Resources		
25-36	Adequate Family Resources	5-6	Adequate Family Resources		
Reference: Manuel Medina Jr. MD and the Section of Supportive Hospice & Palliative Medicine, University of the Philippines-Philippine General Hospital, Manila. 2010.					

**Laboratory Tests**

**Recommendation 3:** Routine use of laboratory test to diagnose malnutrition is currently not recommended (Strong Recommendation, Low Quality Evidence)

The guidelines do not recommend the use of any laboratory test to diagnose malnutrition. In the 2011 ASPEN CPG on Adult Nutrition, experts have advised against the use of albumin and prealbumin to assess nutrition status as they are basically inflammatory markers.<sup>32</sup> According to a consensus statement by AND / ASPEN in 2012, “the use of inflammatory response proteins such as albumin and prealbumin must be interpreted with caution, while other inflammatory markers such as CRP, WBC count and blood glucose level may be requested to aid in determining the etiology of the malnutrition.”<sup>9</sup> This statement was aligned with a more recent consensus report by Bharadwaj, et al. (2016) which states that “while serum proteins such as albumin and prealbumin were previously used by physicians in the determination of nutritional status, the markers have not been reliable on their own and will not replace a nutrition-focused physical examination in the diagnosis of malnutrition.”<sup>33</sup>

According to the Global Leadership Initiative on Malnutrition (GLIM), while clinical indicators of acute and chronic inflammation such as fever, nitrogen balance, acute infection, burns, and chronic inflammatory conditions may discern presence of severe inflammations, inflammation of lesser degree may need supportive inflammatory indicators such as CRP, albumin, or pre-albumin in the work-up based on the physician’s clinical judgment.<sup>3</sup>

**Recommendation 3.1** Laboratory tests may be used to guide in the nutritional management of patients (Strong Recommendation, Low Quality Evidence)

When micronutrients or vitamin deficiency is suspected through thorough physical examination, laboratory assessment of micronutrients such as iron, or vitamins such as vitamins A, B, D, and folate may be performed if feasible.<sup>34</sup>

*Pharmacologic Interventions*

**Recommendation 4:** Routine use vitamin and mineral supplements is not recommended (Strong Recommendation, Low Quality Evidence)

Multivitamins are organic compounds while minerals are inorganic compounds that are essential for normal growth and development. Both are required from the diet in small amounts because the body is unable to synthesize them.<sup>35,36</sup>

Micronutrient supplementation is not for everybody, it is recommended for individuals with diagnosed deficiency or for people with inadequate intake to help them meet their nutritional requirements.<sup>36,41</sup>

**Recommendation 4.1.** Vitamin and mineral supplements may be prescribed for the following (Strong Recommendation, High Quality Evidence):

- a. if with actual clinical manifestations of deficiencies,
- b. if with known deficiencies.
- c. if with conditions at risk for deficiencies

Most people get all the nutrients they need by having a varied and balanced diet. However, some stages of life present a higher risk of deficiency than others, they are the children, adolescents, pregnant women, and the elderly.<sup>35</sup> Other vulnerable groups include those who are vegetarians and those with maintenance medications that alter the absorption and metabolism of certain nutrients.<sup>36</sup>

For Iron Deficiency Anemia, the most vulnerable group are women of reproductive age, severe menstrual blood loss is a major cause of iron deficiency. For pregnant women, iron is needed to cover for the basic losses, for the placenta, fetal growth and for the increase in hemoglobin level. Iron requirements increase greatly during pregnancy that it cannot be covered alone by diet.<sup>37</sup> A meta-analysis looking at the impact of prenatal iron supplementation on maternal hemoglobin included studies from 1966 to 1998. Fifteen studies were from developing countries and 8 studies from developed countries. Daily doses given were as low as < 60 mg/day to as high as > 120 mg/day. The study duration was varied from < 10 weeks to > 20 weeks. 13 out of the 15 studies in the developing countries had a baseline hemoglobin of < 11g/dl, which is the WHO's definition of anemia during pregnancy. When compared to pregnant women who did not receive any supplementation be it in the form of nutrient or supplementation, those who received daily iron supplement had an increase in their hemoglobin levels by  $1.00 \pm 0.013$  g/dl ( $p < .001$   $n = 1,118$ ).<sup>38</sup> Hence, the WHO Policy Brief in 2014 recommended that daily iron and folic acid supplementation be given to all pregnant women as part of their ante natal care. Aside from supplementation, the vulnerable group should be counselled regarding optimal nutrition and the consumption of iron fortified foods.<sup>37,38</sup>

Locally, the recommended iron intake is not met by diet alone among female adults aged 19 – 49 that the Philippine Dietary Reference Intake 2015 (PDRI 2015) recommends that iron fortified foods or supplements be given.<sup>39</sup> This was also observed in the study done by Agdeppa et al. looking into the food sources, energy and nutrient intakes of adults utilizing the results of the 2013 National Nutrition Survey. Iron is the nutrient with the highest prevalence of inadequacy followed by Vitamin C and Calcium.<sup>40</sup>

**Recommendation 5:** Routine use of appetite stimulants is not recommended; rather the underlying cause of loss of appetite should be addressed accordingly (Strong Recommendation, Low Quality Evidence)

Various medical conditions may cause loss of appetite, including cancer, pulmonary tuberculosis, depression, gastrointestinal diseases, dementia, cirrhosis, dysgeusia, and psychosocial problems. Medications, such as anti-depressants, seizure medications, anti-diabetes meds and hormones, likewise may cause loss of appetite and weight loss.

Management should address the underlying cause by treating the medical condition (e.g., depression)<sup>44</sup> or adjusting the medications. Dietary restrictions should be relaxed, and patients allowed to have more liberal intake with appropriate monitoring.

Orexigenics may be used, but with caution, due to insufficient evidence of their use in stimulating appetite in elderly patients with cachexia. When initiating treatment, a trial dose should be given and observed for benefits and side effects prior to continuing appetite stimulants. Treatment of anorexia should be multi-factorial, addressing the interactions between catabolism, inflammation, and nutrition.

Megestrol acetate has demonstrated some improvement in appetite and weight gain in patients with cancer cachexia and AIDs. However, due to marginal benefits and possible side effects, such medication and dronabinol, are not recommended. These medications may be given for only a limited trial to stimulate appetite.<sup>45</sup>

Other commonly used appetite stimulants are Pizotifen, an anti-migraine drug with serotonin and histamine antagonist effect; and Buclizine, used as prophylaxis for motion sickness and for migraine. Buclizine is a piperazine antihistamine with orexigenic, antihistamine, and antiemetic effects. The exact mechanism of action as an appetite stimulant is not known; however, it may be due to a hypoglycemic effect that stimulates the appetite center of the hypothalamus.<sup>46</sup> Both these drugs may cause weight gain and thus are used for their effect on stimulation of appetite. However, there is no evidence to support the recommendation to use them routinely.

**Recommendation 6:** Use oral nutritional supplements (ONS) to augment poor or inadequate intake (Strong Recommendation, High Quality Evidence)

**Recommendation 6.1.** if ONS is not available or is not applicable, use diet fortification as alternative (refer to Recommendation 8.2) (Strong Recommendation, Low Quality Evidence)

Oral nutritional supplements (ONS) are foods for special medical purposes that comprise medical nutrition therapy. They are commercially available liquid or powdered beverages that are specially manufactured for the dietary management of patients under medical supervision.<sup>47</sup> These can also be used as meal replacements. Together with dietary advice and food fortification, ONS can be used as first-line treatment of undernutrition by supplementing inadequate oral intake.<sup>48,49</sup>

Evidence has shown that ONS improves nutritional status of malnourished patients by increasing energy, protein, and micronutrient intake. Clinical benefits include improvement in function (e.g., handgrip strength and quality of life), reduction in complications and mortality, and reduction in hospitalizations and readmissions.<sup>27,50,51</sup>

According to the NICE guidelines on nutrition support for adults, patients on ONS should be supervised and monitored by a trained/



skilled healthcare professional. Monitoring every 3-6 months or more frequently is recommended to reassess the continued need for specialized nutrition.<sup>10</sup>

A vital limitation to prescribing ONS to patients in the Philippines is the limited or lack of availability of these products, especially in rural areas. Hence, patients who are unable to procure ONS should be advised regarding diet or meal fortification with common kitchen ingredients as stated in Recommendation 8.2. Furthermore, due to the cost, ONS is often perceived as additional expense. However, it has been shown in some studies that the use of ONS is cost-effective, especially in those diagnosed to have malnutrition through the MUST.<sup>27</sup>

**Recommendation 7.** Consider enteral nutrition for malnourished patients with impediments to oral feeding and/or with inadequate oral intake (Strong Recommendation, Moderate Quality Evidence)

Enteral nutrition (EN) is nutrition therapy given via tube or stoma into a functioning gastrointestinal tract. It delivers nutrition past the oral cavity when oral feeding is not safe or is inadequate.<sup>47,52</sup> The decision to offer EN depends on many factors: patient's pre-existing nutritional status, disease impact, and desired or anticipated outcomes and benefits.<sup>52</sup> EN is preferred over parenteral nutrition (PN) due to it being more cost-effective and safer with less infectious complications.<sup>52</sup>

Nasoenteric feeding, especially nasogastric tubes (NGT), is the most common. Insertion of an NGT can be done by the primary care physician or a trained nurse. However, when the oral route is inaccessible or the need for tube feeding is longer than 4-6 weeks, the insertion of an appropriate enterocutaneous feeding tube by a specialist may be necessary. The most common is a percutaneous endoscopic gastrostomy tube or PEG placed by a gastroenterologist.<sup>53</sup> When a PEG is not possible, a gastrostomy (or jejunostomy) placed by a surgeon is considered. The decision to insert such tubes requires team discussion which should include the patient and family.

Based on the ESPEN guideline on home enteral nutrition (HEN), HEN should be offered to at-risk or malnourished patients who cannot meet their full requirements orally. It is a life-sustaining therapy. Inadequate oral intake is defined as consuming less than 60% of estimated needs for 1-2 weeks.<sup>54</sup>

The following is a summary of items to instruct or discuss when considering enteral nutrition:<sup>54</sup>

- EN formula and hydration (nutrient needs, fluids, volume, availability of supplies)
- Delivery of EN (manner of delivery, frequency, availability of tubes and equipment)
- EN tube care (tube cleaning, securing tube, frequency of replacement, tube declogging)
- Personal concerns (impact on quality of life/daily life, identified person who will administer feeding, if oral feeding is allowed)
- Delivery of medications and flushing
- Evaluation and follow-up (responsible HCP, frequency, any tests to be done)

If gut feeding (oral or enteral) is not possible or is not sufficiently delivered, parenteral nutrition (PN) should be given as an option. Due to complexity and risks, PN management is best done in a hospital setting and through a team approach. Home PN is possible but requires expertise and training in specialized nutrition support. Referral to appropriate specialists is highly recommended.

#### *Non-pharmacologic Interventions*

**Recommendation 8:** Give nutrition education (Strong Recommendation, High Quality Evidence)

#### *Patient centered and family focused:*

**Recommendation 8.1** Educate the patient and the family using the PAFP-FNRI Pinggang Pinoy® for proper nutrition and hydration (Strong Recommendation, Low Quality Evidence)

The Pinggang Pinoy® was developed and launched by the Department of Science and Technology- Food and Nutrition Research Institute (DOST-FNRI) in 2015. This is a food plate model which serves as a guide for Filipinos of different age group, gender, and condition.<sup>54</sup> In 2020, the PAFP nutrition sub-committee conceptualized nutrition education materials for the whole family using the Pinggang Pinoy® and were approved by the Food and Nutrition Research Institute - (FNRI-DOST).<sup>56</sup> These materials emphasize the consumption of the three basic food groups and adequate water intake to promote healthy and balanced meals and proper hydration.

A study among adults showed that by following the Pinggang Pinoy®, diet quality is improved by lowering energy density and satiety is sustained as measured by visual analogue scale and ghrelin levels.<sup>57</sup> From the policy statement from DOST-FNRI, "the local government unit should initiate the promotion and advocacy of the Pinggang Pinoy® in their respective cities/municipalities and barangays to ensure the improvement of the nutritional status of their constituents through balanced diet and healthy eating habits".<sup>58</sup>

#### *Patient centered:*

**Recommendation 8.2.** Use food fortification and modification as other strategies to increase oral intake (Moderate Recommendation, Low Quality Evidence)

Food fortification is a strategy to address nutritional deficiencies in malnourished or at-risk patients, especially older adults. It may involve adding common kitchen ingredients such as butter, cream, milk powder, or cheese, or commercial supplement liquids or powders to the current or usual diet of a patient without altering volume or portion sizes. This strategy can also address common problems such as taste fatigue.<sup>58,60,61</sup> Protein adequacy may be achieved by simply increasing dairy intake to the recommended four servings daily. This strategy has been shown to reduce malnutrition risk and consequently, reduce the incidence of comorbidities and the rise in healthcare costs.<sup>62</sup>

Although evidence shows that the intake of oral nutritional supplements significantly improves nutritional status, many patients may not tolerate or afford these drinks. A Southeast Asian consensus group recommends diet fortification as a first line strategy in oral nutrition support.<sup>49</sup> Enriching foods could be a more attractive and practical alternative to improve meals. In a study by Morilla-Herrera, et al. food-based fortification increased the total calories and protein consumed by elderly patients in various healthcare settings.<sup>63</sup>

Performing comprehensive nutrition counseling in the context of diet preferences as well as psychosocial and socio-economic factors is an important aspect of nutritional care. Working with nutrition healthcare professionals such as registered nutritionist-dietitians is advisable.

#### *Community oriented*

**Recommendation 8.3.** Encourage the patient and the family to engage in community activities for promotion of good nutrition and to avail of available resources for assistance if needed. (Strong Recommendation, High Quality Evidence)

Malnourished patient and their families are encouraged to participate in community activities. The older adults who are more vulnerable in terms of access to food, are recommended to be provided with information regarding utilization of resources from the community.<sup>12</sup> These include community-based interventions; strong referral and monitoring; community engagement and caregiver support.<sup>12</sup> A systematic review of community level intervention food access improvement for low to middle income countries showed that unconditional cash transfer can improve food security and may have an effect in decreasing malnutrition.<sup>63</sup> There is weak body of evidence supporting the favorable effect of the environmental and organizational intervention on dietary and protein intake of elderly persons.<sup>64</sup>

#### *Family-focused*

**Recommendation 8.4.** Make meals a social activity i.e., eating with family or companion (Strong Recommendation, High Quality Evidence)

The evidence gathered specifically refer to the importance of mealtime as a social activity in the older age group since a well-known risk factor for malnutrition in that age group is depression.<sup>65</sup> Depression could act as a powerful risk for malnutrition in elderly population that it should be controlled by physicians.<sup>66</sup> In a cross-sectional study, the association between family mealtime frequency and depression was investigated among 4,959 elderly men and women aged >65-year-old Koreans. The self-administered questionnaires utilized in the study, analyzed through multiple logistic regression, and adjusted for all covariates, revealed that participants who had three daily family meals had fewer depressive symptoms compared to the group who ate alone. The study concluded that family mealtimes were closely associated with symptoms of depression suggesting that intrafamilial bonding is an important factor to maintain mental health among older population.<sup>67</sup> Prevention of depression through frequent family mealtimes can lead to the improved nutritional state

of the malnourished older people. Based on expert consensus, it is also recommended to encourage older persons to share their mealtimes with others, since eating in company is known to stimulate dietary intake and may also be an important aspect with respect to quality of life.<sup>68</sup> Mealtime interventions (including family-style meals and social dining) are important approaches for managing undernutrition in older people.<sup>12</sup>

#### *Patient-centered*

**Recommendation 8.5.** Advise strength training/ resistance exercise to improve muscle strength and body composition (Strong Recommendation, Moderate Quality Evidence)

Various studies, mostly on older adults, have shown that physical inactivity leads to several chronic complications (e.g., diabetes, hypertension, obesity, cancer). It is also associated with frailty and/or sarcopenia, the age-related loss of muscle mass, strength, and physical function.<sup>11</sup> Physical inactivity, because of hospital admission, may lead to massive losses in muscle mass and strength. This in turn slows down recovery and increases the risk of readmission after discharge.<sup>11</sup> On the corollary, exercise is beneficial in lowering morbidity and mortality in various conditions. The WHO recommends a multi-modal exercise program, which includes strength resistance training as well as balance, flexibility, and aerobic training, for older people with declining physical activity.<sup>69</sup> These exercises may also be done at home to improve physical functioning of the elderly.<sup>70</sup>

Patients who are malnourished may benefit from exercise. Despite low protein intake, exercise intervention has shown to have beneficial effects. A study by Castaneda found that patients with kidney disease and protein intake at only 0.6 g/kg/day still showed positive effects with physical exertion. Likewise, Campbell, et al. found that weight training improved muscle mass and physical function even with a restricted protein intake. However, since evidence is still insufficient on the effects of training on malnourished patients, more research is warranted in this area.<sup>11</sup>

A review of existing systematic reviews and meta-analyses on patients with sarcopenia showed moderate- to high-quality evidence that exercise intervention probably increases walking speed and improved physical performance; exercise may increase the muscle strength (grip strength, knee extension strength); but the effect on grip strength was probably insufficient to achieve important changes for the patient. Similar effects on grip strength and walking speed were also noted in older patients with sarcopenic obesity.<sup>71</sup> Another systematic review by Bao, et al. noted that exercise treatment has been the most used intervention among elderly populations and concluded that exercise programs showed overall significant positive effects on muscle strength and physical performance but not on muscle mass in sarcopenic older adults.<sup>72</sup>

Current guidelines for older adults advocate more physical activity to enhance appetite. However, of various cross-sectional studies reviewed, none found any differences in appetite ratings, and only one study showed that individuals who have regular physical activity had an increased energy intake. Thus, there is no sufficient evidence currently

to support a recommendation to increase acute or habitual physical activity as a way of improving appetite.<sup>73</sup>

**Recommendation 9:** Refer to appropriate professional or institution: (Strong Recommendation, High Quality Evidence)

Health Care Providers should consider using oral, enteral, or parenteral nutrition support, alone or in combination, for patients who are malnourished or at risk of malnutrition. Nutrition intervention should be provided within the first 24–48 hours of contact.<sup>49</sup> Appropriate and timely referrals may be made depending on the need and severity of the medical condition.

**Recommendation 9.1** Refer to dietitian or nutritionist for detailed and individualized diet counselling if warranted (Strong Recommendation, High Quality Evidence)

When a patient requires a structured and detailed diet plan, a referral may be made to a registered nutritionist-dietitian to provide individualized diet counselling.<sup>6,8,26</sup> The diet plan will include the prescribed calorie and protein requirement, proportion of macro nutrients, timing of meals and portion (food exchange) sizes, as well as guidance on foods that may need to be restricted based on the medical condition. In situations where a licensed registered nutritionist-dietitian is not available, nutrition counselling in the community may be provided by a nutritionist.

**Recommendation 9.2** refer to appropriate physician specialists if the undernutrition is secondary to a medical, surgical pathology or to serious co-morbidities. (Strong Recommendation, High Quality Evidence)

When a patient presents with undernutrition secondary to a medical/ surgical pathology or serious co-morbidities, a referral to a physician or specialist is recommended.<sup>12</sup>

Comorbidities that can cause significant nutrition impact symptoms (e.g., anorexia, dysphagia, nausea, vomiting, diarrhea, dysgeusia, pain) include psychiatric conditions; gastrointestinal and surgical cases; oncologic conditions; endocrine emergencies; electrolyte derangements; severe infections; neurologic conditions; and critical illness.

**Recommendation 9.3** refer to a medical facility, nutrition team, or trained homecare team if parenteral nutrition is warranted (Strong Recommendation, Low Quality Evidence)

Parenteral nutrition is indicated in patients with gastrointestinal tract dysfunction (e.g., ileus or other obstruction, severe dysmotility, fistulae, surgical resection, severe malabsorption) that precludes adequate nutrient absorption.<sup>52</sup> Complications such as hyperglycemia, electrolyte abnormalities, congestion from overhydration, as well as Refeeding Syndrome need to be managed and monitored closely in a medically supervised facility.

There are medical facilities with formal nutrition support teams (NST). Ideally, these teams consist of a physician, nurse, dietitian, and

pharmacist who co-manage patients with complicated and challenging nutrition issues.

In some instances, parenteral nutrition can be safely administered at home by a trained home care team. Family Physicians specialized in Palliative Care Medicine or Geriatric Medicine or Medical Nutrition usually lead the home parenteral nutrition (HPN) team. Adherence to HPN protocols by the physicians and nurses will help ensure safe and effective provision of nutrition support at home.

Multidisciplinary care by an NST leads to fewer complications including infection and electrolyte disturbances, and better survival for patients receiving short- and long-term parenteral nutrition (74). Furthermore, it leads to a decrease in inappropriate prescriptions of short-term PN leading to significant cost reduction. Complex care for patients receiving parenteral nutrition necessitates close collaboration between team members and NSTs from other centers to optimize safety and effectiveness of PN use.

**Recommendation 10.** Manage malnutrition risk based on MUST (Moderate Recommendation, Low Quality Evidence)

**Recommendation 10.1.** If low risk, follow recommendation 7 and 8 (Moderate Recommendation, Low Quality Evidence)

**Recommendation 10.2.** If medium risk, follow recommendation 6,7 and 8 (Moderate Recommendation, Low Quality Evidence)

**Recommendation 10.3.** If high risk, follow recommendation 6, 7, 8 and 9 (Moderate Recommendation, Low Quality Evidence)

The management guideline of the MUST include recommendations on dietary advise, use of oral nutritional supplements and referral which is based on the severity of the malnutrition risk. For low risk, dietary advise is given; for medium risk, dietary advise plus use of oral nutritional supplements; and for high risk, dietary advise, use of oral nutritional supplements and referral.<sup>27</sup> The working group modified the MUST management guideline by adding specific strategies under dietary advise and referral that are tailored- fit to the family and community medicine practice in the Philippines. The dietary advises or nutrition education recommendation comprises the use of the locally available nutrition education material (PAFP-FNRI Pinggang Pinoy<sup>56</sup>; food fortification and modification; family focused and community-oriented nutrition interventions; and exercise. The referral recommendation is made more specific such as referral to a dietitian for detailed or individualized diet counselling; referral to appropriate physician specialists if the undernutrition is secondary to a medical/ surgical pathology or to serious co-morbidities; and referral to a medical facility or a nutrition team if parenteral nutrition is warranted. Use of enteral nutrition for patients with impediments to oral feeding and/or with inadequate oral intake is an additional recommendation for low, medium, and high-risk patients.

#### *Patient Outcomes*

**Recommendation 11:** Use GUIDED as mnemonics for reporting patient outcomes (Strong Recommendation, Low Quality Evidence)

Improved nutrition knowledge, measured in terms of knowledge gained, behavioral change and adherence to plan, is among the recommended outcome measures for severe malnutrition.<sup>7</sup> Improving nutrition knowledge was also mentioned as a direct nutrition outcome.<sup>7</sup> For the first visit, patient outcomes are measured through the mnemonics GUIDED:

- G-gained awareness of nature of weight loss/gain
- U-nderstood the drug/ONS prescribed, dose and potential side effects.
- I-identified the risks associated with the current condition.
- D-etermined the possible resources for the resolution of condition
- E-ducated on the importance of nutrition and lifestyle change
- D-o the recommended diagnostic work-up and return visit.

Return visit depends on the MUST malnutrition risk. If patient is classified as low risk, annual visit is recommended.<sup>13,27</sup> If medium risk, patient should follow up every 2-3 month and if high risk<sup>13,27</sup>, return visit should be done monthly.<sup>13,27</sup>

## SECOND VISIT AND CONTINUING VISIT

**Recommendation 1.** Do nutrition Re-screening and Re-assessment: (Strong Recommendation, low quality evidence)

**Recommendation 1.1.** Ask about the effect of intervention (pharmacologic and non-pharmacologic) (Strong Recommendation Low Quality Evidence)

**Recommendation 1.2.** Get results of monitoring (weight, food and exercise) (Strong Recommendation Low Quality Evidence)

**Recommendation 1.3.** Ask about changes in Food pattern and preferences of the family (Strong Recommendation, Low Quality Evidence)

**Recommendation 1.4.** Ask about participation to available resources in relation to nutrition (Strong Recommendation Low Quality Evidence)

On the second and succeeding visits, re-screening and re-assessment must be done. Recommendations 1.1 to 1.4 were questions to be asked to determine if previous pharmacologic and non-pharmacologic management were done and if these caused changes in the nutritional status of the patient and the family.

The other recommendations on diagnostics and management were all the same as the first visit.

**Recommendation 11:** Use GUIDED -FM as mnemonics for reporting patient outcomes (Strong Recommendation, Low Quality Evidence)

For the succeeding visits, the mnemonics GUIDED-FM is recommended which, along with other patient outcomes include Patient-Centered and Family Focused Outcomes measured and monitored as clinical parameters (weight gain, food intake, increase in appetite, improved muscle mass, strength, and function), quality of life, self-rated health & well-being.<sup>7</sup> Monitoring of progress against goals

and modifying intervention appropriately, maintaining communication channels and adjusting of care plan according to patient feedback are helpful in evaluating outcomes.<sup>27</sup>

- G-gained awareness of nature of weight loss/gain (Get results of monitoring: weight loss/gain)
- U-nderstood the drug/ONS prescribed, dose and potential side effects (Ask about the effect of intervention: pharmacologic/ non-pharmacologic)
- I-identified the risks associated with the current condition (Do a nutrition focused physical examination which shall include muscle mass and function, presence or absence of edema, subcutaneous fat changes)
- D-etermined the possible resources for the resolution of condition (Ask about participation to available resources in relation to nutrition)
- E-ducated on the importance of nutrition and lifestyle change (Ask about changes in Food pattern / preferences of the family)
- F-ormulated action plan with the family/compliance
- M-monitored clinical parameters; MUST score.

MUST recommends that nutritional screening should generally be repeated more frequently in hospitals (e.g., at weekly intervals) than in nursing homes (e.g., at monthly intervals) and general practice (from less than one month to more than six months) depending on the circumstances and nutritional risk.<sup>5</sup> If patient is classified as low risk, annual visit is advised.<sup>13,27</sup> If medium risk, every 2-3 months visit and if high risk a monthly visit is recommended.<sup>13,27</sup>

For long term care, particularly among the bedridden but otherwise stable patients, every 3 months follow-up care is recommended.<sup>25</sup>

The above recommendations focus on prevention of decline or improvement of nutritional status and associated outcomes in adults with malnutrition or at risk of malnutrition.

## Variation

Correlate results of requested labs to clinical features and address accordingly. Request for specific laboratory tests to rule out other causes of undernutrition.<sup>8,9</sup>

## Barriers and Facilitators

The nutrition care process is not part of the medical history and physical examination that is routinely done in the clinics. Barriers include lack of training, lack of time due to the number of patients for consultation and lack of staff in the clinic that will do the initial screening. Patients on the other hand may not consider their nutritional status as important and that it affects their over-all condition and may just request for a prescription of multivitamins to address their nutritional problem such as loss of appetite.

WHO in their report entitled "Essential Nutrition Actions: Mainstreaming Nutrition Throughout the Life-course" stated that nutrition is the foundation for health and well-being for all, leaving

no one behind, a key element of primary health care and an essential role in prevention.<sup>75</sup> Guidelines, and recommendations will be of use to enhance the knowledge of doctors in nutrition and give them the confidence to incorporate the nutrition care process in the management of patients.

## Recommendations for Implementation

### Clinic Level

The clinical pathway should serve as a guide for family physicians in the recognition and management of undernutrition among adults seen at the community setting. This will standardize the practice and will ensure that nutrition is given importance in the management of patients. It is recommended that the formulated mnemonics for history taking (WAFFLES) and for outcome measures (GUIDED-FM) be used to facilitate nutrition focused history taking and easy monitoring of patients' outcome. The accomplished reformatted MUST checklist and the SCREAM RES form should also be incorporated to the patient's clinic records for documentation of nutrition risk and assessment of family resources. The use of the PAFP-FNRI Pinggang Pinoy® flyers is recommended to be routinely used as nutrition education aids for patients and their families. Self-review of patient records is encouraged using the clinical pathway.

In areas with limited resources (i.e., ONS, EN, PN,) or with limited manpower and expertise in nutrition practice, the clinical pathway offers alternatives as stated in the specific recommendations.

### Organizational Level

The clinical pathway can be used as a basis for the formulation of chart audits tools by the QA committee to improve and standardize clinical practice of family physicians.

The PAFP can use the clinical pathway in formulating Philhealth Packages for nutrition intervention based on the malnutrition risk level as basis for determining the extent of coverage as part of the implementation of the Universal Health Care law.

### Planned Update

This clinical pathway will be updated every 3 to 5 years depending on the emergence of new nutrition guidelines and evidence. These new guidelines and evidence will be appraised and graded as to the quality of evidence accordingly before appropriate revisions will be made. The revisions will then be presented to a consensus panel for the grading of recommendations.

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Dr. Carlos and Dr. Lorenzo have no conflict of interest to disclose.

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