**NATIONAL QUALITY FORM – Evidence Attachment**

**Submission ID - #3592 Global Malnutrition Composite Score**

Component Measure – Screening for Malnutrition Risk at Admission Pg. 2-10

Component Measure - Completion of a Nutrition Assessment for Patients Pg. 11-18

Identified as At-Risk for Malnutrition

Component Measure - Appropriate Documentation of a Malnutrition Diagnosis Pg. 19-28

Component Measure - Development of a Nutrition Care Plan for Malnourished Pg. 29-37

Patients

**National Quality Forum—Evidence (subcriterion 1a)**

**Measure Number** (*if previously endorsed*)**:** Click here to enter NQF number

**Measure Title**: Screening for Malnutrition Risk at Admission

**IF the measure is a component in a composite performance measure, provide the title of the Composite Measure here:** Global Malnutrition Composite Measure

**Date of Submission**: April 6, 2020

|  |
| --- |
| **Instructions**  *For composite performance measures:*  *A separate evidence form is required for each component measure unless several components were studied together.*  *If a component measure is submitted as an individual performance measure, attach the evidence form to the individual measure submission.*   * Respond to all questions as instructed with answers immediately following the question. All information needed to demonstrate meeting the evidence subcriterion (1a) must be in this form. An appendix of *supplemental* materials may be submitted, but there is no guarantee it will be reviewed. * If you are unable to check a box, please highlight or shade the box for your response. * Maximum of 10 pages (*incudes questions/instructions*; minimum font size 11 pt; do not change margins). ***Contact NQF staff if more pages are needed.*** * Contact NQF staff regarding questions. Check for resources at [Submitting Standards webpage](http://www.qualityforum.org/Measuring_Performance/Submitting_Standards.aspx). |

|  |
| --- |
| **Note: The information provided in this form is intended to aid the Steering Committee and other stakeholders in understanding to what degree the evidence for this measure meets NQF’s evaluation criteria.**    **1a. Evidence to Support the Measure Focus**  The measure focus is evidence-based, demonstrated as follows:   * Outcome: [**3**](#_bookmark0) Empirical data demonstrate a relationship between the outcome and at least one healthcare structure, process, intervention, or service. If not available, wide variation in performance can be used as evidence, assuming the data are from a robust number of providers and results are not subject to systematic bias. * Intermediate clinical outcome: a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#_bookmark1) that the measured intermediate clinical outcome leads to a desired health outcome. * Process: [**5**](#_bookmark2) a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#_bookmark1) that the measured process leads to a desired health outcome. * Structure: a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#_bookmark1)that the measured structure leads to a desired health outcome. * Efficiency: [**6**](#_bookmark3) evidence not required for the resource use component. * For measures derived from patient reports, evidence should demonstrate that the target population values the measured outcome, process, or structure and finds it meaningful. * Process measures incorporating Appropriate Use Criteria: See NQF’s guidance for evidence for measures, in general; guidance for measures specifically based on clinical practice guidelines apply as well.  Notes  1. Generally, rare event outcomes do not provide adequate information for improvement or discrimination; however, serious reportable events that are compared to zero are appropriate outcomes for public reporting and quality improvement. 2. The preferred systems for grading the evidence are the Grading of Recommendations, Assessment, Development and Evaluation [(GRADE) guidelines](http://www.gradeworkinggroup.org/) and/or modified GRADE. 3. Clinical care processes typically include multiple steps: assess  identify problem/potential problem  choose/plan intervention (with patient input)  provide intervention  evaluate impact on health status. If the measure focus is one |

**1a.1.This is a measure of**: (*should be consistent with type of measure entered in De.1*)

Outcome

Health outcome: Click here to name the health outcome

Patient-reported outcome (PRO): Click here to name the PRO

*PROs include HRQoL/functional status, symptom/symptom burden, experience with care, health-related behaviors. (A PRO-based performance measure is not a survey instrument. Data may be collected using a survey instrument to construct a PRO measure.)*

Intermediate clinical outcome (*e.g., lab value*): Click here to name the intermediate outcome

Process: Completion of a malnutrition screening within 24 hours of hospital admission

Appropriate Use Measure: Click here to name what is being measured

Structure: Click here to name the structure

Composite: Click here to name what is being measured

**1a.2.** **LOGIC MODEL:** Diagram or briefly describe the steps between the healthcare structures and processes (e.g., interventions, or services) and the patient’s health outcome(s). The relationships in the diagram should be easily understood by general, non-technical audiences. Indicate the structure, process or outcome being measured.

Nutrition screening completed at admission can identify patients at risk of malnutrition early in the patient stay. Those patients who are identified are then assessed by a registered dietitian who, if appropriate, may recommend a specific nutrition intervention to address the patient’s malnutrition, which if addressed early can reduce risk of mortality and post-operative complications and possibly reduce length of stay.

**1a.3 Value and Meaningfulness: IF** this measure is derived from patient report, provide evidence that the target population values the measured ***outcome, process, or structure*** and finds it meaningful. (Describe how and from whom their input was obtained.)

**\*\*RESPOND TO ONLY ONE SECTION BELOW -EITHER 1a.2, 1a.3 or 1a.4) \*\***

**1a.2 FOR OUTCOME MEASURES including PATIENT REPORTED OUTCOMES - Provide empirical data demonstrating the relationship between the outcome (or PRO) to at least one healthcare structure, process, intervention, or service.**

**1a.3. SYSTEMATIC REVIEW(SR) OF THE EVIDENCE (for INTERMEDIATE OUTCOME, PROCESS, OR STRUCTURE PERFORMANCE MEASURES, INCLUDING THOSE THAT ARE INSTRUMENT-BASED) If the evidence is not based on a systematic review go to section 1a.4) If you wish to include more than one systematic review, add additional tables.**

**What is the source of the systematic review of the body of evidence that supports the performance measure? A systematic review is a scientific investigation that focuses on a specific question and uses explicit, prespecified scientific methods to identify, select, assess, and summarize the findings of similar but separate studies. It may include a quantitative synthesis (meta-analysis), depending on the available data. (IOM)**

Clinical Practice Guideline recommendation

US Preventive Services Task Force Recommendation

Other systematic review and grading of the body of evidence (*e.g., Cochrane Collaboration, AHRQ Evidence Practice Center*)

Other

|  |  |
| --- | --- |
| **Source of Systematic Review:**   * **Title** * **Author** * **Date** * **Citation, including page number** * **URL** | Mueller C, Compher C & Druyan ME and the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Board of Directors. A.S.P.E.N. Clinical Guidelines: Nutrition Screening, Assessment, and Intervention in Adults. J Parenter Enteral Nutr. 2011;35: 16-24.  <https://onlinelibrary.wiley.com/doi/epdf/10.1177/0148607110389335> |
| Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the  conclusions from the SR. | “Screening for nutrition risk is suggested for hospitalized patients” (p.g. 19)  “Nutrition risk, identified by nutrition screening, is associated with longer length of hospital stay, complications, and mortality. In varied adult populations, patients who are identified as malnourished by various screening tools have longer length of hospital stay, and complications. Mortality risk is also predicted by malnutrition screening. Screening those individuals at risk of malnutrition is the first step in nutrition care.” (p.g. 19-20) |
| Grade assigned to the **evidence** associated with the recommendation with the  definition of the grade | Grade E - Supported by Level IV or V evidence  Level IV Evidence: Nonrandomized cohort with historical controls  Level V Evidence: Case series, uncontrolled studies, and expert opinion |
| Provide all other grades and definitions  from the evidence grading system | Level I Evidence: Large randomized trials with clear‐cut results; low risk of false‐positive (α) and/or false‐negative (β) error  Level II Evidence: Small, randomized trials with uncertain results; moderate to high risk of false‐positive (α) and/or false‐negative (β) error  Level II Evidence: Nonrandomized cohort with contemporaneous controls |
| Grade assigned to the **recommendation**  with definition of the grade | E – Supported by level IV or V evidence |
| Provide all other grades and definitions  from the recommendation grading system | A- Supported by at least 2 level I investigations  B- Supported by 1 level 1 investigation  C- Supported by at least 1 level III investigation  D- Supported by at least 1 level III investigation |
| Body of evidence:   * Quantity – how many studies? * Quality – what type of studies? | 9 observational studies (descriptive cohorts) 1 nonrandomized cohort with contemporaneous controls |
| Estimates of benefit and consistency  across studies | Screening for malnutrition risk is a non-intensive and low-burden process for identifying patients in need of further assessment of nutritional status. Nutrition risk as identified by screening can be a strong predictor of hospital length of stay, risk of 30-day readmission, and complications. Some studies also showed a weak association with mortality, but generally the evidence is inconsistent on that outcome. |
| What harms were identified? | No adverse events were identified |
| Identify any new studies conducted since  the SR. Do the new studies change the conclusions from the SR? | Yes several new studies have been completed and published since the SR (see below), but results do not contradict earlier findings and reiterate what was reported in the initial SR. |

**ESTIMATES OF BENEFIT AND CONSISTENCY ACROSS STUDIES IN BODY OF EVIDENCE**

**What are the estimates of benefit—magnitude and direction of effect on outcome(s) across studies in the body of evidence**? (*e.g., ranges of percentages or odds ratios for improvement/ decline across studies, results of meta-analysis, and statistical significance*)

Outcomes from 1a.4: Malnutrition risk identified in patients through nutrition screening was able to predict outcomes including:

|  |  |
| --- | --- |
| **Outcome of Interest** | **Study Findings from Review** |
| Length of Stay (LOS) | There were 2 studies (Kyle, 2006 & Amaral, 2008) that reported predicting OR for increased LOS based off nutrition screening scores from the MUST (OR:3.1-3.24) and 1 study (Kyle, 2006) reported the NRS 2002 (OR:2.9), 1 study reported a decrease in LOS in patients who were identified as at risk for malnutrition and were treated early (9.5 days vs 13 days, P=0.02)  There were 3 studies that reported nutrition screen score predicted patient LOS (P <.001 - 0.022) (Kruizenga, 2005; Stratton, 2006; Scheisser, 2008; |
| Mortality | In one study (Yang, 2007), the screening score using the Subjective Global Assessment (SGA) predicted mortality (R2=0.2). However, one other study (Atalay, 2008) reported no difference in mortality incidence with increasing malnutrition risk using the SGA (P=0.86). |
| Post-Operative Complications | The guideline reported 1 study (Putwatana, 2005) reported that the NRC predicted post-operative complications, (OR: 2.92), Scheisser (2008) reported that the NRS 2002 predicted the complication rate in at-risk patients, P<0.001 and severe complications in at-risk patients, P<0.001; OR:2.8.  Finally, one study (Scheisser, 2009) reported that the NRS predicted the postsurgical complications, (OR: 4.2). |

**What harms were studied and how do they affect the net benefit (benefits over harms)?**

Harms and adverse events to patients were not reported in either the clinical practice guideline or systematic review. Evidence of harm / risk to patient from malnutrition screening was not reported in any of the incremental studies since the publication of the systematic review.

**UPDATE TO THE SYSTEMATIC REVIEW(S) OF THE BODY OF EVIDENCE**

**Valladares AF, Kilgore KM, Partridge J, Sulo S, Kerr KW, McCauley S. How a malnutrition quality improvement initiative furthers malnutrition measurement and care: results from a hospital learning collaborative. JPEN J Parenter Enteral Nutr. Published online April 13, 2020.**

In this study, the implementation of malnutrition-focused quality improvement practices significantly improved the identification of malnutrition. The prompt identification and treatment of patients at malnutrition risk can improve patient care and health, as well as reduce costly readmissions. Improvements were observed for all 4 malnutrition quality measures. The greatest improvements were achieved as a result of timely nutrition assessment (P = .06) and malnutrition diagnosis (P = .02). Patients ≥65 years with a malnutrition diagnosis and nutrition care plan had a 24% lower likelihood of 30-day readmission but a longer mean LOS than did those without a care plan.

**Eglseer D, et al. The impact of using a malnutrition screening tool in a hospital setting: a mixed methods study. Eur J Clin Nutr. 2019;73(2):284-292.**

The use of the screening tool positively correlated with significant improvements in the process indicators of nutritional care after 1 month, in terms of the number of nutritional interventions and the frequency of documentation of the diagnosis and the patient’s weight and height.

**Martín-Sánchez FJ, et al. Effect of risk of malnutrition on 30-day mortality among older patients with acute heart failure in Emergency Departments. Eur J Intern Med. 2019;65:69-77.**

Secondary analysis of the OAK-3 Registry including all consecutive patients ≥65 years in 749 patients.

Risk of malnutrition was observed in 594 (79.3%) patients. The rate of 30-day mortality was 8.8%. After adjusting for MEESSI-AHF risk score clinical categories (model 1) and after adding all variables showing a significantly different distribution among groups (model 2), the risk of malnutrition was an independent factor associated with 30-day mortality compared to normal nutritional status.

This study reinforces that malnutrition screening detects malnutrition risk in older adults and that Routine screening of risk of malnutrition may help emergency physicians in decision-making and establishing a care plan.

**Sauer AC, et al. Prevalence of Malnutrition Risk and the Impact of Nutrition Risk on Hospital Outcomes: Results From nutritionDay in the U.S. JPEN. 2019;43(7):918-926.**

This study analyzed data from 2009 to 2015 for all adult patients from participating hospitals. Data was analyzed for 9,959 adult patients from 601 wards. The overall prevalence of malnutrition risk (MST score 2) was 32.7%. On nutritionDay, 32.1% of patients ate a quarter of their meal or less. Hospital mortality hazard ratio was 3.24 (95% CI: [1.73, 6.07]; P-value < 0.001) for patients eating a quarter compared with those who ate all their meal and increased to 5.99 (95% CI: [3.03, 11.84]; P-value < 0.0001) for patients eating nothing despite being allowed to eat.

This study provides the most robust estimate of malnutrition risk in U.S. hospitalized patients to date, finding that approximately 1 in 3 are at risk. Additionally, patients who have diminished meal intake experience increased mortality risk. These results highlight the ongoing issue of malnutrition in the hospital setting.

**Sanson G, et al. Prediction of early- and long-term mortality in adult patients acutely admitted to internal medicine: NRS-2002 and beyond. Clin Nutr. 2019. pii: S0261-5614(19)30184-0.**

A retrospective observational study including 5,698 consecutive patients acutely admitted to the internal medicine department. 37.2% of patients were categorized as high risk for malnutrition according to the NRS-2002. Patients classified at high malnutrition risk (NRS-2002 ≥ 3) showed a higher and earlier mortality (Log-rank test: p < 0.001) compared to subjects in the NRS-2002 "low-risk" group. NRS-2002 ≥ 3 was an independent significant (p < 0.01) predictor of mortality in logistic regression at every time interval.

This study showed that malnutrition risk identified upon hospital admission by NRS-2002 independently contributes to early and late mortality in a population including a majority of elderly.

**Siegel S, et al. Impact of a Nutrition-Focused Quality Improvement Intervention on Hospital Length of Stay. J Nurs Care Qual. 2018;34(3):203–209.**

Retrospective study that reviewed the medical records of 20,697 adult patients to determine whether early initiation of nutrition therapy had reduced hospital length of stay and 30-day readmission rates. Researchers found that the average time from hospital admission to oral nutrition supplement initiation was reduced by 20 hours (20.8%) after the quality improvement initiative was introduced (P < .01). Length of stay decreased 0.88 days (P < .05) more for patients at nutritional risk than patients not at nutritional risk; the probability of 30-day hospital readmission did not differ between groups.

The study highlights the importance of adequate nutrition screening, diagnosis, and treatment for hospitalized patients.

**Goldfarb M et al. Malnutrition and mortality in frail and non-frail older adults undergoing aortic value replacement. Circulation 2018 Jul 5. pii: CIRCULATIONAHA.118.033887.**

Prospective multicenter cohort study was conducted between 2012 and 2017 in 14 centers in 3 countries. Patients ≥70 years of age who underwent transcatheter or surgical aortic valve replacement were eligible. Overall, 8.7% of patients were classified as malnourished and 32.8% were at-risk for malnutrition. MNA-SF scores were moderately correlated with SPPB scores (Spearman R=0.31, P<0.001). There were 126 deaths in the TAVR group (19.1 per 100 patient-years) and 30 deaths in the SAVR group (7.5 per 100 patient-years). Malnourished patients had a nearly 3-fold higher crude risk of 1-year mortality compared with those with normal nutritional status (28% vs 10%, P<0.001). After adjustment for frailty, STS-PROM, and procedure type, pre-procedural nutritional status was a significant predictor of 1-year mortality (OR 1.08 per MNA-SF point, 95% CI 1.01-1.16) and of the 30-day composite safety endpoint (OR 1.06 per MNA-SF point, 95% CI 1.00 to 1.12).

The study found that preprocedural nutritional status is associated with mortality in older adults undergoing aortic valve replacement.

**Eglseer D et al. Is the presence of a validated malnutrition screening tool associated with better nutritional care in hospitalized patients? Nutrition 2017 May;37:104-111.**

This was a cross-sectional, multicenter study that collected data using a standardized questionnaire on three levels: institution (presence of a guideline for malnutrition), department (use of a validated screening tool), and patient (e.g., malnutrition prevalence). In all, 53 hospitals with 5255 patients participated. About 45% of the hospitals indicated that they have guidelines for malnutrition. Of the departments surveyed, 38.6% used validated screening tools as part of a standard procedure. The nutritional status of 74.5% of the patients was screened during admission, mostly on the basis of clinical observation and patient weight. A validated screening tool was used for 21.2% of the patients. Significant differences between wards with and without validated screening tools were found with regard to malnutrition prevalence (P = 0.002) and the following interventions: referral to a dietitian (P < 0.001), provision of energy-enriched snacks (P = 0.038), adjustment of consistency (food/drinks; P = 0.004), monitoring of the nutritional intake (P = 0.001), and adjustment of the meal ambiance (P < 0.001).

The study found that nutritional screening with validated tools in hospitalized patients remains poor. Generally, the nutritional status of patients is screened with unreliable parameters such as clinical observation and body mass index. The results of the present study suggest that the use of validated malnutrition screening tools is associated with better nutritional care and lower malnutrition prevalence rates in hospitalized patients.

**Guerra RS, Sousa AS, Fonseca I, et al. Comparative analysis of undernutrition screening and diagnostic tools as predictors of hospitalisation costs. J Hum Nutr Diet. 2016;29(2):165-73.**

Study aims (i) to explore whether undernutrition status at hospital admission, as evaluated by different screening and diagnostic tools, can predict patient's hospitalisation costs and (ii) to provide an updated economic analysis of undernutrition burden.

Undernutrition risk according to NRS-2002 and high undernutrition risk according to 'MUST' increased patient's costs, respectively, by 21.1% [95% confidence interval (CI) = 9.0-33.2%] and 28.8% (95% CI = 13.7-39.9%). The cost of a nutritionally-at-risk or undernourished patient is between €416 (95% CI = €156-675) and €617 (95% CI = €293-855) higher than the average of the respective diagnosis-related group.

The study associated malnutrition risk with increased patient costs which was identified using screening tools (NRS-2002 and MUST) which predict risk of malnutrition (termed as undernutrition in this article).

**Khalatbari-soltani S, Marques-vidal P. Impact of nutritional risk screening in hospitalized patients on management, outcome and costs: A retrospective study. Clin Nutr. 2016;**

Retrospective analysis of administrative data for years 2013 and 2014 from the department of internal medicine of the Lausanne university hospital (8541 hospitalizations, mean age 72.8 ± 16.5 years, 50.4% women). Being nutritionally 'at-risk' was defined as a Nutritional risk screening-2002 score ≥ 3 and nutritional managements were collected from medical records.

Less than half of patients 'at-risk' received any nutritional management, and this value decreased between 2013 and 2014 (46.9% vs. 40.3%, p < 0.05). After multivariate adjustment, 'at-risk' patients had a 3.7-fold (95% confidence interval: 1.91; 7.03) higher in-hospital mortality and higher costs (excess 5642.25 ± 1479.80 CHF in 2013 and 5529.52 ± 847.02 CHF in 2014, p < 0.001) than 'not at-risk' patients, while no difference was found for LOS.

This study reinforces the association between risk of malnutrition and mortality (risk ratio: 3.7, p<0.001) as well as with higher cost of care (p<0.001), and a non-significant higher risk of length of stay, p=0.50)

**Gomes F, Emery PW, Weekes CE. Risk of Malnutrition Is an Independent Predictor of Mortality, Length of Hospital Stay, and Hospitalization Costs in Stroke Patients. J Stroke Cerebrovasc Dis. 2016;25(4):799-806.**

543 patients were recruited from consecutive admissions at 2 hyperacute stroke units in London and were screened for risk of malnutrition (low, medium, and high) according to MUST. Six-month outcomes were obtained for each patient through a national database.

Results showed a highly significant increase in mortality with increasing risk of malnutrition (P < .001). This association remained significant after adjusting for age, severity of stroke, and a range of stroke risk factors. For those patients who survived, the LOS and hospitalization costs increased with increasing risk of malnutrition.

This study showed a statistically significant association between mortality and increasing risk of malnutrition (P<0.001). Increasing risk of malnutrition was associated with longer LOS and increased hospitalization costs (P<.001 and P=0.001, respectively)

**Lew CC, Yandell R, Fraser RJ, Chua AP, Chong MF, Miller M. Association Between Malnutrition and Clinical Outcomes in the Intensive Care Unit: A Systematic Review. JPEN. Journal of parenteral and enteral nutrition. 2016.**

This systematic review aims to identify the link between malnutrition and poor clinical outcomes in the intensive care unit (ICU). After reviewing 20 out of an original search that included 1168 studies, authors found that the prevalence of malnutrition ranged from 38% to 78%. Malnutrition, as diagnosed by nutrition assessments, was found to be independently associated with increased ICU length of stay, ICU readmission, incidence of infection, and risk of mortality.

**Cereda E, Klersy C, Pedrolli C, et al. The Geriatric Nutritional Risk Index predicts hospital length of stay and in-hospital weight loss in elderly patients. Clin Nutr. 2015;34(1):74-8.**

Nutritional risk was assessed by the Geriatric Nutritional Risk Index (GNRI) in a prospective multicentre hospital-based cohort study on a sample of 667 patients. The outcomes were LOS and in-hospital WL.

Patients with a high nutritional risk were more likely (OR = 1.89; 95%CI: 1.22-2.92) to stay longer in hospital (fourth quartile, LOS ≥ 20 days) compared to those without.

Study supports association with nutritional risk identified from nutrition screening with increased LOS (OR=1.89)

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**1a.4 OTHER SOURCE OF EVIDENCE**

If source of evidence is NOT from a clinical practice guideline, USPSTF, or systematic review, please describe the evidence on which you are basing the performance measure.

**1a.4.1 Briefly SYNTHESIZE the evidence that supports the measure.** A list of references without a summary is not acceptable.

**1a.4.2 What process was used to identify the evidence?**

**1a.4.3. Provide the citation(s) for the evidence.**

**National Quality Forum—Evidence (subcriterion 1a)**

**Measure Number** (*if previously endorsed*)**:** Click here to enter NQF number

**Measure Title**: Completion of a Nutrition Assessment for Patients Identified as At-Risk for Malnutrition

**IF the measure is a component in a composite performance measure, provide the title of the Composite Measure here:** Global Malnutrition Composite Measure

**Date of Submission**: N/A

|  |
| --- |
| **Instructions**  *For composite performance measures:*  *A separate evidence form is required for each component measure unless several components were studied together.*  *If a component measure is submitted as an individual performance measure, attach the evidence form to the individual measure submission.*   * Respond to all questions as instructed with answers immediately following the question. All information needed to demonstrate meeting the evidence subcriterion (1a) must be in this form. An appendix of *supplemental* materials may be submitted, but there is no guarantee it will be reviewed. * If you are unable to check a box, please highlight or shade the box for your response. * Maximum of 10 pages (*incudes questions/instructions*; minimum font size 11 pt; do not change margins). ***Contact NQF staff if more pages are needed.*** * Contact NQF staff regarding questions. Check for resources at [Submitting Standards webpage](http://www.qualityforum.org/Measuring_Performance/Submitting_Standards.aspx). |

|  |
| --- |
| **Note: The information provided in this form is intended to aid the Steering Committee and other stakeholders in understanding to what degree the evidence for this measure meets NQF’s evaluation criteria.**  **1a. Evidence to Support the Measure Focus**  The measure focus is evidence-based, demonstrated as follows:   * Outcome: [**3**](#_bookmark0) Empirical data demonstrate a relationship between the outcome and at least one healthcare structure, process, intervention, or service. If not available, wide variation in performance can be used as evidence, assuming the data are from a robust number of providers and results are not subject to systematic bias. * Intermediate clinical outcome: a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#_bookmark1) that the measured intermediate clinical outcome leads to a desired health outcome. * Process: [**5**](#_bookmark2) a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#_bookmark1) that the measured process leads to a desired health outcome. * Structure: a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#_bookmark1)that the measured structure leads to a desired health outcome. * Efficiency: [**6**](#_bookmark3) evidence not required for the resource use component. * For measures derived from patient reports, evidence should demonstrate that the target population values the measured outcome, process, or structure and finds it meaningful. * Process measures incorporating Appropriate Use Criteria: See NQF’s guidance for evidence for measures, in general; guidance for measures specifically based on clinical practice guidelines apply as well.  Notes  1. Generally, rare event outcomes do not provide adequate information for improvement or discrimination; however, serious reportable events that are compared to zero are appropriate outcomes for public reporting and quality improvement. 2. The preferred systems for grading the evidence are the Grading of Recommendations, Assessment, Development and Evaluation [(GRADE) guidelines](http://www.gradeworkinggroup.org/) and/or modified GRADE. 3. Clinical care processes typically include multiple steps: assess  identify problem/potential problem  choose/plan intervention (with patient input)  provide intervention  evaluate impact on health status. If the measure focus is one |

**1a.1.This is a measure of**: (*should be consistent with type of measure entered in De.1*)

Outcome

Health outcome: Click here to name the health outcome

Patient-reported outcome (PRO): Click here to name the PRO

*PROs include HRQoL/functional status, symptom/symptom burden, experience with care, health-related behaviors. (A PRO-based performance measure is not a survey instrument. Data may be collected using a survey instrument to construct a PRO measure.)*

Intermediate clinical outcome (*e.g., lab value*): Click here to name the intermediate outcome

Process: Completion of a nutrition assessment for patients identified to be at-risk of malnutrition from a completed malnutrition screening

Appropriate Use Measure: Click here to name what is being measured

Structure: Click here to name the structure

Composite: Click here to name what is being measured

**1a.2.** **LOGIC MODEL:** Diagram or briefly describe the steps between the healthcare structures and processes (e.g., interventions, or services) and the patient’s health outcome(s). The relationships in the diagram should be easily understood by general, non-technical audiences. Indicate the structure, process or outcome being measured.

Nutrition screening completed at admission can identify patients at risk of malnutrition early in the patient stay. Those patients who are identified are then assessed by a registered dietitian who, if appropriate, may recommend a specific nutrition intervention to address the patient’s malnutrition, which if addressed early can reduce risk of mortality and post-operative complications and possibly reduce length of stay.

**1a.3 Value and Meaningfulness: IF** this measure is derived from patient report, provide evidence that the target population values the measured ***outcome, process, or structure*** and finds it meaningful. (Describe how and from whom their input was obtained.)

**\*\*RESPOND TO ONLY ONE SECTION BELOW -EITHER 1a.2, 1a.3 or 1a.4) \*\***

**1a.2 FOR OUTCOME MEASURES including PATIENT REPORTED OUTCOMES - Provide empirical data demonstrating the relationship between the outcome (or PRO) to at least one healthcare structure, process, intervention, or service.**

**1a.3. SYSTEMATIC REVIEW(SR) OF THE EVIDENCE (for INTERMEDIATE OUTCOME, PROCESS, OR STRUCTURE PERFORMANCE MEASURES, INCLUDING THOSE THAT ARE INSTRUMENT-BASED) If the evidence is not based on a systematic review go to section 1a.4) If you wish to include more than one systematic review, add additional tables.**

**What is the source of the systematic review of the body of evidence that supports the performance measure? A systematic review is a scientific investigation that focuses on a specific question and uses explicit, prespecified scientific methods to identify, select, assess, and summarize the findings of similar but separate studies. It may include a quantitative synthesis (meta-analysis), depending on the available data. (IOM)**

Clinical Practice Guideline recommendation

US Preventive Services Task Force Recommendation

Other systematic review and grading of the body of evidence (*e.g., Cochrane Collaboration, AHRQ Evidence Practice Center*)

Other

|  |  |
| --- | --- |
| **Source of Systematic Review:**   * **Title** * **Author** * **Date** * **Citation, including page number** * **URL** | Mueller C, Compher C & Druyan ME and the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Board of Directors. A.S.P.E.N. Clinical Guidelines: Nutrition Screening, Assessment, and Intervention in Adults. J Parenter Enteral Nutr. 2011;35: 16-24.  <https://onlinelibrary.wiley.com/doi/epdf/10.1177/0148607110389335> |
| Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the  conclusions from the SR. | “Nutrition assessment: Nutrition assessment is suggested for all patients who are identified to be at nutrition risk by nutrition screening: Grade E.” (Page 22)  “Rationale- Malnourished patients, identified by nutrition assessment tools, have more complications and longer hospitalizations than do patients with optimal nutrition status. Such patients, identified by nutrition assessment tools, have more infectious and noninfectious complications, longer hospital length of stay, and greater mortality. With one exception, studies have shown malnourished patients to have greater mortality.” (Page 22) |
| Grade assigned to the **evidence** associated with the recommendation with the  definition of the grade | Grade E – Supported by level IV or V evidence  Level IV Evidence: Nonrandomized cohort with historical controls  Level V Evidence: Case series, uncontrolled studies, and expert opinion |
| Provide all other grades and definitions  from the evidence grading system | Level I Evidence: Large randomized trials with clear‐cut results; low risk of false‐positive (α) and/or false‐negative (β) error  Level II Evidence: Small, randomized trials with uncertain results; moderate to high risk of false‐positive (α) and/or false‐negative (β) error  Level III Evidence: Nonrandomized cohort with contemporaneous controls. |
| Grade assigned to the **recommendation**  with definition of the grade | E – Supported by level IV or V evidence |
| Provide all other grades and definitions  from the recommendation grading system | A- Supported by at least 2 level I investigations  B- Supported by 1 level I investigation  C- Supported by at least 1 level III investigation  D- Supported by at least 1 level III investigation |
| Body of evidence:   * Quantity – how many studies? * Quality – what type of studies? | 9 Case series, uncontrolled studies, and expert  opinion |
| Estimates of benefit and consistency  across studies | The assessment of nutritional status by a Registered Dietitian Nutritionist (RDN) can determine the severity of malnutrition which is a strong predictor of hospital length of stay, risk of 30-day readmission, and complications and mortality. |
| What harms were identified? | No adverse events were identified |
| Identify any new studies conducted since  the SR. Do the new studies change the conclusions from the SR? | Yes several new studies have been completed and published since the SR (see below), but results do not contradict earlier findings and reiterate what was reported in the initial SR. |

**FINDINGS FROM SYSTEMATIC REVIEW OF BODY OF THE EVIDENCE supporting the measure**

*If more than one systematic review of the evidence is identified above, you may choose to summarize the one (or more) for which the best information is available to provide a summary of the quantity, quality, and consistency of the body of evidence. Be sure to identify which review is the basis of the responses in this section and if more than one, provide a separate response for each review.*

**ESTIMATES OF BENEFIT AND CONSISTENCY ACROSS STUDIES IN BODY OF EVIDENCE**

**What are the estimates of benefit—magnitude and direction of effect on outcome(s) across studies in the body of evidence**? (*e.g., ranges of percentages or odds ratios for improvement/ decline across studies, results of meta-analysis, and statistical significance*)

|  |  |
| --- | --- |
| **Outcome of Interest** | **Study Findings from Review** |
| Body Composition | Norman (2008) study predicted significant improvement in body weight and body cell mass follow a three-month intervention of high-protein and energy supplements while Odeli (2005), found that patients managed using the nutrition care process experienced less weight loss (mean weight change -4.2 kg +/-6.4 cf. -8.9 kg +/- 5.9, P = 0.03) |
| Cost | Kruizenga (2005) found that, to shorten the mean length of hospital stay by 1 d for all malnourished patients, a mean investment of 76 euros (91 US dollars) in nutritional screening and treatment was needed. |
| Length of Stay (LOS) | Kruizenga (2005) found early screening and treatment of malnourished patients reduced the LOS in malnourished patients with low handgrip strength (i.e., frail patients) and another study found that patients managed using the NP had a shorter length of stay (3.2 days +/- 5.4 cf. 13.5 days +/- 14.1, P = 0.002) (Odeli 2005). |
| Muscle Function | Persson (2007) found that treated-as-protocol analyses showed that Katz ADL index improved in the I-group (p<0.001; p<0.05 between the groups). |
| Nutritional Intake | Babineau (2008) reported significant increases in energy (p=0.0001) and protein (p=0.01) intakes, and in serum albumin (p=0.001), prealbumin (p=0.003), transferrin (p=0.024), and hematocrit (p=0.026) levels. An additional study of standardized nutrition care added approximately 600 kcal and 12 g protein to the daily intake of malnourished patients (Kruizenga 2005) |
| Readmission | Norman (2008) study found dietary counselling patients experienced significantly more readmissions (n=20) than oral nutritional supplement patients (n=10) during the study period (p=0.041). One additional study found that fewer patients managed using standardized nutrition care had an unplanned hospital admission (46% cf. 75%, P = 0.04) (Odeli, 2005). |

Lew CC, Yandell R, Fraser RJ, Chua AP, Chong MF, Miller M. Association Between Malnutrition and Clinical Outcomes in the Intensive Care Unit: A Systematic Review. JPEN J Parenter Enteral Nutr. 2016;

<http://www.ncbi.nlm.nih.gov/pubmed/26838530>

|  |  |
| --- | --- |
| **Outcome of Interest** | **Study Findings from Review** |
| Mortality Associated with Malnutrition Identified from the SGA | Five studies of lower risk of bias (Caporossi,2012; Fontes, 2014; Sheean, 2013; Lomivorotov, 2013; Merli, 2010) reported that malnutrition identified from a validated nutrition assessment tool was associated with higher hospital mortality , but not independently associated with ICU mortality. |
| Incidence of Infection (IOI) Associated with Malnutrition Identified from the SGA | Malnutrition was independently associated with higher IOI 4.5 vs 0.6 episodes per patient, adjusted, P = .0001 (Merli, 2010) |
| Risk of ICU Readmission Associated with Malnutrition Identified from the SGA | Malnutrition was independently associated with risk of ICU readmission (OR=2.27; 95% CI, 1.08 – 4.80; P<.05) |
| Percentage of patients discharged to nursing homes vs. own homes | Sheean (2013) reported that the percentage of malnourish elderly patients discharged home was 28.6% lower than well-nourished patients (p=0.001) |
| Post-operative complications associated with Malnutrition | Lomivorotov (2013) and Sheean 2013 both reported increased risk of postoperative complications for patients diagnosed with malnutrition using the MNA (OR=1.60, 95% CI, 1.10-2.20; P<.01) |

**1a.7.8.** **What harms were studied and how do they affect the net benefit (benefits over harms)?**

Harms and adverse events to patients were not reported in either the clinical practice guideline or systematic review.

**UPDATE TO THE SYSTEMATIC REVIEW(S) OF THE BODY OF EVIDENCE**

**Valladares AF, Kilgore KM, Partridge J, Sulo S, Kerr KW, McCauley S. How a malnutrition quality improvement initiative furthers malnutrition measurement and care: results from a hospital learning collaborative. JPEN J Parenter Enteral Nutr. Published online April 13, 2020.**

In this study, the implementation of malnutrition-focused quality improvement practices significantly improved the identification of malnutrition. The prompt identification and treatment of patients at malnutrition risk can improve patient care and health, as well as reduce costly readmissions. Improvements were observed for all 4 malnutrition quality measures. The greatest improvements were achieved as a result of timely nutrition assessment (P = .06) and malnutrition diagnosis (P = .02). Patients ≥65 years with a malnutrition diagnosis and nutrition care plan had a 24% lower likelihood of 30-day readmission but a longer mean LOS than did those without a care plan.

**Pratt KJ, Hernandez B, Blancato R, Blankenship J, Mitchell K. Impact of an interdisciplinary malnutrition quality improvement project at a large metropolitan hospital. BMJ Open Qual. 2020;9(1).**

This study evaluated an institution-wide, multipronged model for detecting deficiencies in malnutrition care and implementing changes to address them based on the clinical workflow the malnutrition clinical quality measures are focused on. Following the multipronged series of interventions described above, the hospital documented a 25% (2-day) overall reduction in LOS for malnourished/at-risk patients (from 8 days to 6 days, p<0.01) and a 22.2% (2-day) reduction in LOS for malnourished/at-risk patients with infections (from 9 days to 7 days, p=0.10). Infection rates among malnourished patients declined 35.7% (from 14% to 9%, p<0.01). Changes in readmission rates over time were not statistically significant. Additionally, process improvement was noted for the rate at which nursing staff completed malnutrition risk screening (88% to 95% pre-to-postimplementation) and referred those patients for nutrition assessment.

**Danis K, et al. Identifying and Managing Malnourished Hospitalized Patients Utilizing the Malnutrition**

**Quality Improvement Initiative: The UPMC Experience. JAND. 2019;119(9):S40-S43.**

This article’s findings demonstrate that use of the malnutrition clinical quality measures to support malnutrition-focused quality improvement projects can improve malnutrition assessment and diagnosis. The quality improvement implementation focused on hospital-wide adoption of the Nutrition Focused Physical Examination (NFPE). The MQii team was guided by the malnutrition electronic clinical quality measures focused on completing a nutrition assessment (the NFPE) within 24 hours of identification of malnutrition risk and ensuring documentation of a malnutrition diagnosis when it was identified. Performance on both measures improved significantly (P<0.01).

**Mordarski BA, Hand RK. Patterns in Adult Malnutrition Assessment and Diagnosis by Registered Dietitian Nutritionists: 2014-2017. JAND. 2019;119(2):310-322.**

Based on this study’s longitudinal survey (n=1,022 in time 1, and n=799 in time 2), use of the Academy/ASPEN Adult Malnutrition Clinical Characteristics to diagnose malnutrition increased demonstrably from 2014 to 2017. Respondents who reported documenting malnutrition using the Academy/ASPEN criteria increased significantly from 57.4% to 71.3% (P<0.001). This parallel increases in hospital patients with a malnutrition diagnosis, which increased from 4.0% to 4.9% between 2014 and 2015 in a multi-institutional database. Finally, respondents reported various barriers to appropriate diagnosis of malnutrition being incorporated in the patient’s medical record demonstrating that most often when the diagnosis is not followed through with it is a process failure given there are few barriers from its completion.

**Hudson L, Chittams J, Griffith C, Compher C. Malnutrition Identified by Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition Is Associated With More 30-Day Readmissions, Greater Hospital Mortality, and Longer Hospital Stays: A Retrospective Analysis of Nutrition Assessment Data in a Major Medical Center. JPEN J Parenter Enteral Nutr. 2018;**

30-day readmissions (primary outcome), hospital mortality, length of stay (LOS) in survivors, and time to discharge alive (TDA) in all patients assessed as malnourished or not malnourished using these criteria in fiscal year 2015. We hypothesized more frequent admissions, greater mortality, longer LOS, and less likely shorter TDA in the malnourished patients. Demographic variables, clinical outcomes, and malnutrition diagnosis for all initial patient admissions were obtained retrospectively from the electronic medical record. Logistic regression was used to compare categorical and Cox proportional hazards for TDA in unadjusted and adjusted (age, sex, race, medical/surgical admission, Charlson Comorbidity Index) models.

Of the 3907 patients referred for nutrition assessment, 66.88% met criteria for moderate or severe malnutrition. Malnourished patients were older (61 vs 58 years, P < .0001), and survivors had longer LOS (15 vs 12 days, P = .0067) and were more likely to be readmitted within 30 days (40% vs 23%, P < .0001). In adjusted models, 30-day readmissions (odds ratio [OR] 2.13, 95% confidence interval [CI] 1.82-2.48) and hospital mortality (OR 1.47, 95% CI 1.0-1.99) were increased, and the likelihood of earlier TDA was reduced (hazard ratio [HR] 0.55, 95% CI 0.44-0.77) in those who had >2-day stay.

**Silver HJ, Pratt KJ, Bruno M, Lynch J, Mitchell K, Mccauley SM. Effectiveness of the Malnutrition Quality Improvement Initiative on Practitioner Malnutrition Knowledge and Screening, Diagnosis, and Timeliness of Malnutrition-Related Care Provided to Older Adults Admitted to a Tertiary Care Facility: A Pilot Study. J Acad Nutr Diet. 2018;118(1):101-109.**

6-month prospective pilot of 1912 patients recruited from 45 healthcare professionals from geriatric, general medicine, and general surgery units at Vanderbilt University hospital from January to June 2016. Participants were patients aged ≥18 y admitted to medical and surgical wards. The study included a 3-month intervention with training and education modules tailored to type of practitioner and integrated into existing teaching and clinical workflow. Malnutrition knowledge was assessed by 30-item questionnaire; electronic medical record (EMR) documentation; and timeliness of malnutrition screening, diagnosis, intervention, and discharge planning.

Malnutrition knowledge score increased 14%, from 39% to 53% (P=0.009). All patients whose nutrition screen indicated they were malnourished/high risk had registered dietitian nutritionist diagnosis of malnutrition documented in the EMR. The proportion who had medical provider (physician, nurse practitioner, or physician assistant) malnutrition diagnosis documented in the EMR increased 11.6%, from 26.7% to 38.3% (P=0.08). About 95% of malnourished/high risk patients had a documented intervention addressing malnutrition. Inclusion of malnutrition care in the discharge plan increased 4.8%, from 70.0% to 74.8% (P=0.13).

**Guerra RS, Fonseca I, Sousa AS, Jesus A, Pichel F, Amaral TF. ESPEN diagnostic criteria for malnutrition - A validation study in hospitalized patients. Clin Nutr. 2017;36(5):1326-1332.**

A prospective observational study took place in a university hospital. Concurrent validity of EDC was evaluated using the Patient Generated Subjective Global Assessment (PG-SGA) nutrition status classification as the reference method. Sensitivity, specificity, positive and negative predictive values were determined. The EDC predictive validity was assessed by its independent association with length of hospital stay (LOS), applying Cox proportional hazards ratio method.

Of the 632 included patients, 455 participants (72%) were nutritionally-at-risk (Nutritional Risk Screening initial screening). For those that had screened positive, 260 (57.1%) and 55 participants (12.1%) were undernourished according to PG-SGA and to EDC, respectively. Compared to PG-SGA, the EDC revealed a sensitivity of 17.1% and a specificity of 98.3%. Positive and negative predictive values were respectively 89.1% and 58.9%. Undernutrition evaluated by EDC was independently associated with lower hazard ratio for being discharged home over time, 0.695 (95% confidence interval: 0.509; 0.950).

**Hiller LD, Shaw RF, Fabri PJ. Difference in Composite End Point of Readmission and Death Between Malnourished and Nonmalnourished Veterans Assessed Using Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition Clinical Characteristics. JPEN J Parenter Enteral Nutr. 2017;41(8):1316-1324.**

A retrospective chart review comparing veterans with malnutrition based on a modified version of the Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition consensus characteristics that used 5 of the 6 clinical characteristics to a matched control group of nonmalnourished veterans based on age, admitting service, and date of admission who were admitted between August 1, 2012, and December 1, 2014. Data were extracted from the medical record. Multivariate analysis was used to identify predictors of outcomes.

In total, 404 patients were included in the final analysis. All end points were found to be statistically significant. The malnourished group was more likely to meet the composite end point (odds ratio [OR], 5.3), more likely to be readmitted within 30 days (OR, 3.4), more likely to die within 90 days of discharge (OR, 5.5), and more likely to have a length of stay >7 days (OR, 4.3) compared with the nonmalnourished group. Length of stay was significantly longer in the malnourished group, 9.80 (11.5) vs 4.38 (4.5) days.

**Jeejeebhoy KN et al. Nutritional assessment: comparison of clinical assessment and objective variables for the prediction of length of hospital stay and readmission. *Am J Clin Nutr* 2015; 101: 956-965.**

Prospective cohort study of 1022 patients recruited from 18 acute care hospitals (academic and community), from 8 provinces across Canada, between 1 July 2010 and 28 February 2013. Participants were patients aged ≥18 y admitted to medical and surgical wards. Researchers measured the following indicators at admission: subjective global assessment (SGA; SGA A = well nourished, SGA B = mild or moderate malnutrition, and SGA C = severe malnutrition), Nutrition Risk Screening (2002), body weight, midarm and calf circumference, serum albumin, handgrip strength (HGS), and patient-self assessment of food intake. Logistic regression determined the independent effect of indicators on the outcomes of length of hospital stay (<7 d and ≥7 d) and readmission within 30 d after discharge.

The outcome of severe malnutrition (SGA score of C) was an independent predictor of length of stay and 30 day readmissions (OR: 2.12; 95% CI: 1.24, 3.93). This study supports the conclusion that patients who are malnourished in the hospital are at a significantly higher risk of adverse secondary outcomes. If these patients can be identified and subsequently treated for malnutrition, there may be an associated reduction in length of stay and 30-day readmissions.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**1a.4 OTHER SOURCE OF EVIDENCE**

If source of evidence is NOT from a clinical practice guideline, USPSTF, or systematic review, please describe the evidence on which you are basing the performance measure.

**1a.4.1 Briefly SYNTHESIZE the evidence that supports the measure.** A list of references without a summary is not acceptable.

**1a.4.2 What process was used to identify the evidence?**

**1a.4.3. Provide the citation(s) for the evidence.**

**National Quality Forum—Evidence (subcriterion 1a)**

**Measure Number** (*if previously endorsed*)**:** Click here to enter NQF number

**Measure Title**: Appropriate Documentation of a Malnutrition Diagnosis

**IF the measure is a component in a composite performance measure, provide the title of the Composite Measure here:** Global Malnutrition Composite Measure

**Date of Submission**: N/A

|  |
| --- |
| **Instructions**  *For composite performance measures:*  *A separate evidence form is required for each component measure unless several components were studied together.*  *If a component measure is submitted as an individual performance measure, attach the evidence form to the individual measure submission.*   * Respond to all questions as instructed with answers immediately following the question. All information needed to demonstrate meeting the evidence subcriterion (1a) must be in this form. An appendix of *supplemental* materials may be submitted, but there is no guarantee it will be reviewed. * If you are unable to check a box, please highlight or shade the box for your response. * Maximum of 10 pages (*incudes questions/instructions*; minimum font size 11 pt; do not change margins). ***Contact NQF staff if more pages are needed.*** * Contact NQF staff regarding questions. Check for resources at [Submitting Standards webpage](http://www.qualityforum.org/Measuring_Performance/Submitting_Standards.aspx). |

|  |
| --- |
| **Note: The information provided in this form is intended to aid the Steering Committee and other stakeholders in understanding to what degree the evidence for this measure meets NQF’s evaluation criteria.**  **1a. Evidence to Support the Measure Focus**  The measure focus is evidence-based, demonstrated as follows:   * Outcome: [**3**](#_bookmark0) Empirical data demonstrate a relationship between the outcome and at least one healthcare structure, process, intervention, or service. If not available, wide variation in performance can be used as evidence, assuming the data are from a robust number of providers and results are not subject to systematic bias. * Intermediate clinical outcome: a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#_bookmark1) that the measured intermediate clinical outcome leads to a desired health outcome. * Process: [**5**](#_bookmark2) a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#_bookmark1) that the measured process leads to a desired health outcome. * Structure: a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#_bookmark1)that the measured structure leads to a desired health outcome. * Efficiency: [**6**](#_bookmark3) evidence not required for the resource use component. * For measures derived from patient reports, evidence should demonstrate that the target population values the measured outcome, process, or structure and finds it meaningful. * Process measures incorporating Appropriate Use Criteria: See NQF’s guidance for evidence for measures, in general; guidance for measures specifically based on clinical practice guidelines apply as well.  Notes  1. Generally, rare event outcomes do not provide adequate information for improvement or discrimination; however, serious reportable events that are compared to zero are appropriate outcomes for public reporting and quality improvement. 2. The preferred systems for grading the evidence are the Grading of Recommendations, Assessment, Development and Evaluation [(GRADE) guidelines](http://www.gradeworkinggroup.org/) and/or modified GRADE. 3. Clinical care processes typically include multiple steps: assess  identify problem/potential problem  choose/plan intervention (with patient input)  provide intervention  evaluate impact on health status. If the measure focus is one |

**1a.1.This is a measure of**: (*should be consistent with type of measure entered in De.1*)

Outcome

Health outcome: Click here to name the health outcome

Patient-reported outcome (PRO): Click here to name the PRO

*PROs include HRQoL/functional status, symptom/symptom burden, experience with care, health-related behaviors. (A PRO-based performance measure is not a survey instrument. Data may be collected using a survey instrument to construct a PRO measure.)*

Intermediate clinical outcome (*e.g., lab value*): Click here to name the intermediate outcome

Process: Completion of a nutrition assessment for patients identified to be at-risk of malnutrition from a completed malnutrition screening

Appropriate Use Measure: Click here to name what is being measured

Structure: Click here to name the structure

Composite: Click here to name what is being measured

**1a.2.** **LOGIC MODEL:** Diagram or briefly describe the steps between the healthcare structures and processes (e.g., interventions, or services) and the patient’s health outcome(s). The relationships in the diagram should be easily understood by general, non-technical audiences. Indicate the structure, process or outcome being measured.

Patients who are identified as at-risk for malnutrition are then assessed by a registered dietitian nutritionist (RDN) who, if appropriate, may recommend a specific nutrition intervention to address the patient’s malnutrition. The recommendations are shared with the patient’s physician team who then make the clinical judgement to diagnose the patient with malnutrition based off the RDN’s assessment. If the malnutrition is addressed early can reduce risk of mortality and post-operative complications and possibly reduce length of stay.

**1a.3 Value and Meaningfulness: IF** this measure is derived from patient report, provide evidence that the target population values the measured ***outcome, process, or structure*** and finds it meaningful. (Describe how and from whom their input was obtained.)

**\*\*RESPOND TO ONLY ONE SECTION BELOW -EITHER 1a.2, 1a.3 or 1a.4) \*\***

**1a.2 FOR OUTCOME MEASURES including PATIENT REPORTED OUTCOMES - Provide empirical data demonstrating the relationship between the outcome (or PRO) to at least one healthcare structure, process, intervention, or service.**

**1a.3. SYSTEMATIC REVIEW(SR) OF THE EVIDENCE (for INTERMEDIATE OUTCOME, PROCESS, OR STRUCTURE PERFORMANCE MEASURES, INCLUDING THOSE THAT ARE INSTRUMENT-BASED) If the evidence is not based on a systematic review go to section 1a.4) If you wish to include more than one systematic review, add additional tables.**

**What is the source of the systematic review of the body of evidence that supports the performance measure? A systematic review is a scientific investigation that focuses on a specific question and uses explicit, prespecified scientific methods to identify, select, assess, and summarize the findings of similar but separate studies. It may include a quantitative synthesis (meta-analysis), depending on the available data. (IOM)**

Clinical Practice Guideline recommendation

US Preventive Services Task Force Recommendation

Other systematic review and grading of the body of evidence (*e.g., Cochrane Collaboration, AHRQ Evidence Practice Center*)

Other

|  |  |
| --- | --- |
| **Source of Systematic Review:**   * **Title** * **Author** * **Date** * **Citation, including page number** * **URL** | Mueller C, Compher C & Druyan ME and the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Board of Directors. A.S.P.E.N. Clinical Guidelines: Nutrition Screening, Assessment, and Intervention in Adults. J Parenter Enteral Nutr. 2011;35: 16-24.  https://onlinelibrary.wiley.com/doi/epdf/10.1177/0148607110389335 |
| Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the  conclusions from the SR. | “Nutrition support intervention is recommended for patients identified by screening and assessment as at risk for malnutrition or malnourished. Grade C” (Page 22)  “Rationale - Nutrition support intervention in patients identified by screening and assessment as at risk for malnutrition or malnourished may improve clinical outcomes. This guideline places nutrition assessment and screening in the context of intervention as part of nutrition care. Nutrition intervention in malnourished patients was associated with improved nutrition status nutrient intake physical function and quality of life. In addition, hospital readmissions were reduced.” (Page 23) |
| Grade assigned to the **evidence** associated with the recommendation with the  definition of the grade | Grade C- Supported by at least 1 level II investigation  Level III Evidence: Nonrandomized cohort with contemporaneous controls. |
| Provide all other grades and definitions  from the evidence grading system | Level I Evidence: Large randomized trials with clear‐cut results; low risk of false‐positive (α) and/or false‐negative (β) error  Level II Evidence: Small, randomized trials with uncertain results; moderate to high risk of false‐positive (α) and/or false‐negative (β) error  Level IV Evidence: Nonrandomized cohort with historical controls  Level V Evidence: Case series, uncontrolled studies, and expert opinion |
| Grade assigned to the **recommendation**  with definition of the grade | C- Supported by at least 1 level III investigation |
| Provide all other grades and definitions  from the recommendation grading system | A- Supported by at least 2 level I investigations  B- Supported by 1 level I investigation  D- Supported by at least 1 level III investigation  E – Supported by level IV or V evidence |
| Body of evidence:   * Quantity – how many studies? * Quality – what type of studies? | 3 small, randomized trials  1 nonrandomized cohort with historical controls  1 nonrandomized cohort with contemporaneous controls |
| Estimates of benefit and consistency  across studies | Although the two SR’s cited for this measure are not explicit systematic reviews of the “diagnosis of malnutrition” they do demonstrate the impact of nutrition intervention that is a result of a malnutrition diagnosis. More recent individual studies have modeled the impacts of a malnutrition diagnosis more thoroughly. |
| What harms were identified? | No adverse events were identified |
| Identify any new studies conducted since  the SR. Do the new studies change the conclusions from the SR? | New evidence since the publication of these SR’s suggest that malnutrition diagnosis is a strong predictor of increase length of stay, 30-day readmission risk, mortality risk, infections, complications and high hospital costs. |

**OTHER SYSTEMATIC REVIEW OF THE BODY OF EVIDENCE**

Milne AC, Potter J, Vivanti A, Avenell A. Protein and energy supplementation in elderly people at risk from malnutrition. Cochrane Database Syst Rev. 2009;(2):CD003288.

URL: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003288.pub3/abstract?systemMessage=Wiley+Online+Library+will+be+unavailable+on+Saturday+14th+May+11:00-14:00+BST+/+06:00-09:00+EDT+/+18:00-21:00+SGT+for+essential+maintenance.Apologies+for+the+inconvenience

**FINDINGS FROM SYSTEMATIC REVIEW OF BODY OF THE EVIDENCE supporting the measure**

*If more than one systematic review of the evidence is identified above, you may choose to summarize the one (or more) for which the best information is available to provide a summary of the quantity, quality, and consistency of the body of evidence. Be sure to identify which review is the basis of the responses in this section and if more than one, provide a separate response for each review.*

**ESTIMATES OF BENEFIT AND CONSISTENCY ACROSS STUDIES IN BODY OF EVIDENCE**

**What are the estimates of benefit—magnitude and direction of effect on outcome(s) across studies in the body of evidence**? (*e.g., ranges of percentages or odds ratios for improvement/ decline across studies, results of meta-analysis, and statistical significance*)

Mueller et al. Findings fromClinical Guideline

|  |  |
| --- | --- |
| **Outcome of Interest** | **Study Findings from Review** |
| Body Composition | Norman (2008) study predicted significant improvement in body weight and body cell mass follow a three-month intervention of high-protein and energy supplements while Odeli (2005), found that patients managed using the nutrition care process experienced less weight loss (mean weight change -4.2 kg +/-6.4 cf. -8.9 kg +/- 5.9, P = 0.03) (Odeli, 2005). |
| Cost | Kruizenga (2005) found that, to shorten the mean length of hospital stay by 1 d for all malnourished patients, a mean investment of 76 euros (91 US dollars) in nutritional screening and treatment was needed. |
| Length of Stay (LOS) | Kruizenga (2005) found early screening and treatment of malnourished patients reduced the LOS in malnourished patients with low handgrip strength (i.e., frail patients) and another study found that patients managed using the NP had a shorter length of stay (3.2 days +/- 5.4 cf. 13.5 days +/- 14.1, P = 0.002) (Odeli 2005). |
| Muscle Function | Persson (2007) found that treated-as-protocol analyses showed that Katz ADL index improved in the I-group (p<0.001; p<0.05 between the groups). |
| Nutritional Intake | Babineau (2008) reported significant increases in energy (p=0.0001) and protein (p=0.01) intakes, and in serum albumin (p=0.001), prealbumin (p=0.003), transferrin (p=0.024), and hematocrit (p=0.026) levels. An additional study of standardized nutrition care added approximately 600 kcal and 12 g protein to the daily intake of malnourished patients (Kruizenga 2005) |
| Readmission | Norman (2008) study found dietary counselling patients experienced significantly more readmissions (n=20) than oral nutritional supplement patients (n=10) during the study period (p=0.041). One additional study found that fewer patients managed using standardized nutrition care had an unplanned hospital admission (46% cf. 75%, P = 0.04) (Odeli, 2005). |

Milne et al. Findings fromClinical Guideline

|  |  |
| --- | --- |
| **Outcome of Interest** | **Study Findings from Review** |
| Mortality | 48 included studies with a total of 8,031 participants when meta-analyzed, reported an overall relative risk (RR) of 0.92.    The subgroup analyses suggested that the results were statistically significant or approaching statistical significance when limited to trials in which participants (N = 2461) were defined as undernourished (RR 0.79), and when 400 kcal or more was offered per day in the supplement (N = 7307), (RR 0.89).    The results were consistent when analysis was restricted to 15 trials (N = 6604) with clearly concealed randomization (RR 0.91) |
| Cost | 24 trials with a total of 6,225 participants were meta-analyzed and overall, reported a statistically significant difference between intervention and control for risk of complications (RR=0.86).    In subgroup analyses, hip fracture patients were also at reduced risk of complications (RR=0.60). |
| Length of Stay (LOS) | 12 studies were meta-analyzed and pooled weighted mean difference for LOS using a random-effects model showed no benefit from supplementation -0.8 days (-2.8 to 1.3) with significant heterogeneity (chi-square 25.53; df 13; P = 0.02; I2 = 49%). Subgroup analyses for length of stay were too limited to suggest any difference between diagnostic groups. |
| Quality of Life | Few studies were able to provide data on improvements in functional status or quality of life in general, apart from handgrip data. Measures were too diverse or too limited to combine for meta-analyses. |

**What harms were studied and how do they affect the net benefit (benefits over harms)?**

18 trials discussed adverse effects from nutritional supplementation, but no studies compared intervention group with control groups. Problems with tolerance and side-effects were reported in 12 studies including nausea, vomiting and diarrhea in the intervention group.

**UPDATE TO THE SYSTEMATIC REVIEW(S) OF THE BODY OF EVIDENCE**

**Valladares AF, Kilgore KM, Partridge J, Sulo S, Kerr KW, McCauley S. How a malnutrition quality improvement initiative furthers malnutrition measurement and care: results from a hospital learning collaborative. JPEN J Parenter Enteral Nutr. Published online April 13, 2020.**

In this study, the implementation of malnutrition-focused quality improvement practices significantly improved the identification of malnutrition. The prompt identification and treatment of patients at malnutrition risk can improve patient care and health, as well as reduce costly readmissions. Improvements were observed for all 4 malnutrition quality measures. The greatest improvements were achieved as a result of timely nutrition assessment (P = .06) and malnutrition diagnosis (P = .02). Patients ≥65 years with a malnutrition diagnosis and nutrition care plan had a 24% lower likelihood of 30-day readmission but a longer mean LOS than did those without a care plan.

**Danis K, et al. Identifying and Managing Malnourished Hospitalized Patients Utilizing the Malnutrition**

**Quality Improvement Initiative: The UPMC Experience. JAND. 2019;119(9):S40-S43.**

The quality improvement implementation focused on hospital-wide adoption of the Nutrition Focused Physical Examination (NFPE) and improvement of coordination between registered dietitians and physicians. The care team was guided by the malnutrition electronic clinical quality measures focused on completing a nutrition assessment (the NFPE) within 24 hours of identification of malnutrition risk and ensuring documentation of a malnutrition diagnosis when it was identified. Performance on both measures improved significantly (P<0.01).

**Tobert CM, Mott SL, Nepple KG. Malnutrition Diagnosis during Adult Inpatient Hospitalizations: Analysis of a Multi-Institutional Collaborative Database of Academic Medical Centers. J Acad Nutr Diet. 2018;118(1):125-131.**

The University Health System Consortium (Vizient) database was retrospectively reviewed for reported rates of malnutrition diagnosis. All adult inpatient hospitalization at 105 member institutions during fiscal years 2014 and 2015 were evaluated for malnutrition diagnosis based on the presence of an International Classification of Diseases (ICD) -Ninth Revision diagnosis code. Hospital volume and publicly available hospital rankings and patient satisfaction scores were obtained. Multiple regression analysis was performed to assess the association between these variables and reported rates of malnutrition.

A total of 5,896,792 hospitalizations were identified from 105 institutions during the 2-year period. It was found that 292,754 patients (5.0%) had a malnutrition diagnosis during their hospital stay. By institution, median rate of malnutrition diagnosis during hospitalization was 4.0%, whereas the rate of severe malnutrition diagnosis was 0.9%. There was a statistically significant increase in malnutrition diagnosis from 4.0% to 4.9% between 2014 and 2015 (P<0.01). Institutional factors associated with increased diagnosis of malnutrition were higher hospital volume, hospital ranking, and patient satisfaction scores (P<0.01).

**Meehan A, Loose C, Bell J, Partridge J, Nelson J, Goates S. Health System Quality Improvement: Impact of Prompt Nutrition Care on Patient Outcomes and Health Care Costs. J Nurs Care Qual. 2016.**

Quality improvement program that positioned early nutritional care into the nursing workflow. Nurses screened formal nutrition risk at patient admission and then immediately ordered oral nutritional supplements for those at risk. Supplements were given as regular medications, guided and monitored by medication administration records.

Length of stay (-0.77 days or 13.4%), probability of readmissions (-17%) and cost of care (-$969 or 8.8%) were all reduced (p<0.01).

This observational study supports early intervention on patients who are found to be at-risk of malnutrition.

**Snider JT, Jena AB, Linthicum MT, et al. Effect of hospital use of oral nutritional supplementation on length of stay, hospital cost, and 30-day readmissions among Medicare patients with COPD. Chest. 2015;147(6):1477-84.**

Retrospective cohort study identified hospitalizations in which ONS was provided, and used propensity-score matching to compare LOS, hospitalization cost, and 30-day readmission rates in a one-to-one matched sample of ONS and non-ONS hospitalizations.

One-to-one matched sample was created with 14,326 cases. In unadjusted comparisons in the matched sample, ONS use was associated with longer LOS (8.7 days vs 6.9 days, P < .0001), higher hospitalization cost ($14,223 vs $9,340, P < .0001), and lower readmission rates (24.8% vs 26.6%, P = .0116). However, in instrumental variables analysis, ONS use was associated with a 1.9-day (21.5%) decrease in LOS, from 8.8 to 6.9 days (P < .01); a hospitalization cost reduction of $1,570 (12.5%), from $12,523 to $10,953 (P < .01); and a 13.1% decrease in probability of 30-day readmission, from 0.34 to 0.29 (P < .01).

ONS may be associated with reduced LOS, hospitalization cost, and readmission risk in hospitalized Medicare patients with existing morbidities such as COPD.

**Cawood AL, Elia M, Stratton RJ. Systematic review and meta-analysis of the effects of high protein oral nutritional supplements. Ageing Res Rev. 2012;11(2):278-96.**

The review concluded that high protein oral nutritional supplements had significant clinical, nutritional and functional benefits in a range of patient groups and health settings.

The authors' conclusions are reasonable but considerable clinical diversity in the included studies causes some uncertainty as to their generalizability. This systematic review involving 36 randomized controlled trials (RCT) (n=3790) (mean age 74 years; 83% of trials in patients >65 years) and a series of meta-analyses of high protein ONS (>20% energy from protein) demonstrated a range of effects across settings and patient groups in favor of the high protein ONS group.

The outcomes analyzed in this meta-analysis support the conclusions made in the systematic review and guideline cited above which include reduced complications (odds ratio (OR) 0.68 (95%CI 0.55-0.83), p<0.001, 10 RCT, n=1830); reduced readmissions to hospital (OR 0.59 (95%CI 0.41-0.84), p=0.004, 2 RCT, n=546).

**Somanchi M et al. The facilitated early enteral and dietary management effectiveness trial in hospitalized patients with malnutrition. JPEN 2011 Mar;35(2):209-16.**

A retrospective cohort analysis using demographic data, anthropometric measurements, LOS, and serum albumin levels were collected from 400 patients in 2 medical wards to determine the prevalence of malnutrition and potential delays in nutrition consultation. Based on these results, a nutrition intervention study was conducted in 1 ward; the other ward served as a control. Patients were classified as normally nourished or malnourished. Multivariate general linear regressions were used to reveal the impact of intervention on the change in LOS, controlling for other potential confounding factors on the cohort and a subset with severe malnutrition.

Of the 400 patients assessed, 53% had malnutrition. Multiple general linear regressions showed that nutrition intervention reduced LOS an average of 1.93 days in the cohort group and 3.2 days in the severe malnourished group. Case mix index and female gender were positively associated with LOS in the malnourished group. Nutrition intervention reduced the delays in implementing nutrition support to patients by 47%.

**Weiss AJ, Fingar KR, Barrett ML, Elixhauser A, Steiner CA, Guenter P, Brown MH. Characteristics of Hospital Stays Involving Malnutrition, 2013. HCUP Statistical Brief #210. September 2016. Agency for Healthcare Research and Quality, Rockville, MD.**

Healthcare Cost and Utilization Project (HCUP) Statistical Brief presents national estimates on the characteristics of malnutrition reported during nonmaternal and nonneonatal hospital inpatient stays in 2013. Although malnutrition can include high caloric intake associated with overweight and obesity when defined broadly as nutritional imbalance, this Statistical Brief examines undernutrition only.

Association of a malnutrition diagnosis with up to 5x risk of in-hospital mortality, up to 2x higher hospital costs, up to 2x longer length of stay. Average hospital costs were higher for stays involving protein-calorie malnutrition ($25,200) and postsurgical nonabsorption ($23,000) than for other stays without malnutrition ($12,500).

**Fingar KR, et al. Statistical Brief #281: All-Cause Readmissions Following Hospital Stays for Patients With Malnutrition, 2013. Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project. September 2016.**

Healthcare Cost and Utilization Project (HCUP) Statistical Brief supplements a 2013 HCUP Statistical Brief that describes inpatient hospital stays among patients with six types of malnutrition: postsurgical nonabsorption, nutritional neglect, cachexia, protein-calorie malnutrition, weight loss or failure to thrive, and underweight. The current Statistical Brief presents additional information on the all-cause 30-day rate of readmissions following an initial inpatient hospital stay for patients with malnutrition in the United States in 2013, following the same typology of malnutrition presented in the earlier Statistical Brief.

In 2013, the all-cause 30-day readmission rate for patients with malnutrition was 23.0 per 100, compared with 14.9 per 100 for patients without malnutrition. The average cost per readmission was $16,900 for patients with protein-calorie malnutrition during an index stay and $17,900 for patients with postsurgical nonabsorption—26 and 34 percent higher, respectively, than the readmission cost for patients without malnutrition during an index stay ($13,400).

**Deutz NE, Matheson EM, Matarese LE, et al. Readmission and mortality in malnourished, older, hospitalized adults treated with a specialized oral nutritional supplement: A randomized clinical trial. Clinical nutrition (Edinburgh, Scotland). 2016;35(1):18-26.**

Patients found at-risk from screening and subsequently assessed for malnutrition (per Subjective Global Assessment), malnourished received nutrition support which was associated with decreased 30, 60, 90-day mortality. The primary composite endpoint was similar between high-protein oral nutritional supplement (HP-HMB) (26.8%) and placebo (31.1%). No between-group differences were observed for 90-day readmission rate, but 90-day mortality was significantly lower with HP-HMB relative to placebo (4.8% vs. 9.7%; relative risk 0.49, 95% confidence interval [CI], 0.27 to 0.90; p = 0.018). The number-needed-to-treat to prevent 1 death was 20.3 (95% CI: 10.9, 121.4). Compared with placebo, HP-HMB resulted in improved odds of better nutritional status (SGA class, OR, 2.04, 95% CI: 1.28, 3.25, p = 0.009) at day 90, and an increase in body weight at day 30 (p = 0.035).

The study found that compared with placebo HP-HMB decreased mortality and improved indices of nutritional status during the 90-day observation period.

**Corkins MR et al. Malnutrition diagnoses in hospitalized patients: United States, 2010.2014 Feb;38(2):186-95.**

Examined data from the 2010 Healthcare Cost and Utilization Project (HCUP), the most recent nationally-representative data describing U.S. hospital discharges. Using ICD-9 codes, we constructed a composite variable indicating a diagnosis of malnutrition. 3.2% of all U.S. hospital discharges in 2010 had this diagnosis. Relative to patients without a malnutrition diagnosis, those with the diagnosis were older, had longer lengths of stay and incurred higher costs. These patients were more likely to have 27 of 29 comorbidities assessed in HCUP. Finally, discharge to home care was twice as common among malnourished patients, and a discharge of death was more than 5 times as common among patients with a malnutrition diagnosis. Taken together, these nationally representative, cross-sectional data indicate that hospitalized patients discharged with a diagnosis of malnutrition are older and sicker and their inpatient care is more expensive than their counterparts without this diagnosis.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**1a.4 OTHER SOURCE OF EVIDENCE**

If source of evidence is NOT from a clinical practice guideline, USPSTF, or systematic review, please describe the evidence on which you are basing the performance measure.

**1a.4.1 Briefly SYNTHESIZE the evidence that supports the measure.** A list of references without a summary is not acceptable.

**1a.4.2 What process was used to identify the evidence?**

**1a.4.3. Provide the citation(s) for the evidence.**

**National Quality Forum—Evidence (subcriterion 1a)**

**Measure Number** (*if previously endorsed*)**:** Click here to enter NQF number

**Measure Title**: Development of a Nutrition Care Plan for Malnourished Patients

**IF the measure is a component in a composite performance measure, provide the title of the Composite Measure here:** Global Malnutrition Composite Score

**Date of Submission**: N/A

|  |
| --- |
| **Instructions**  *For composite performance measures:*  *A separate evidence form is required for each component measure unless several components were studied together.*  *If a component measure is submitted as an individual performance measure, attach the evidence form to the individual measure submission.*   * Respond to all questions as instructed with answers immediately following the question. All information needed to demonstrate meeting the evidence subcriterion (1a) must be in this form. An appendix of *supplemental* materials may be submitted, but there is no guarantee it will be reviewed. * If you are unable to check a box, please highlight or shade the box for your response. * Maximum of 10 pages (*incudes questions/instructions*; minimum font size 11 pt; do not change margins). ***Contact NQF staff if more pages are needed.*** * Contact NQF staff regarding questions. Check for resources at [Submitting Standards webpage](http://www.qualityforum.org/Measuring_Performance/Submitting_Standards.aspx). |

|  |
| --- |
| **Note: The information provided in this form is intended to aid the Steering Committee and other stakeholders in understanding to what degree the evidence for this measure meets NQF’s evaluation criteria.**  **1a. Evidence to Support the Measure Focus**  The measure focus is evidence-based, demonstrated as follows:   * Outcome: [**3**](#_bookmark0) Empirical data demonstrate a relationship between the outcome and at least one healthcare structure, process, intervention, or service. If not available, wide variation in performance can be used as evidence, assuming the data are from a robust number of providers and results are not subject to systematic bias. * Intermediate clinical outcome: a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#_bookmark1) that the measured intermediate clinical outcome leads to a desired health outcome. * Process: [**5**](#_bookmark2) a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#_bookmark1) that the measured process leads to a desired health outcome. * Structure: a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#_bookmark1)that the measured structure leads to a desired health outcome. * Efficiency: [**6**](#_bookmark3) evidence not required for the resource use component. * For measures derived from patient reports, evidence should demonstrate that the target population values the measured outcome, process, or structure and finds it meaningful. * Process measures incorporating Appropriate Use Criteria: See NQF’s guidance for evidence for measures, in general; guidance for measures specifically based on clinical practice guidelines apply as well.  Notes  1. Generally, rare event outcomes do not provide adequate information for improvement or discrimination; however, serious reportable events that are compared to zero are appropriate outcomes for public reporting and quality improvement. 2. The preferred systems for grading the evidence are the Grading of Recommendations, Assessment, Development and Evaluation [(GRADE) guidelines](http://www.gradeworkinggroup.org/) and/or modified GRADE. 3. Clinical care processes typically include multiple steps: assess  identify problem/potential problem  choose/plan intervention (with patient input)  provide intervention  evaluate impact on health status. If the measure focus is one |

**1a.1.This is a measure of**: (*should be consistent with type of measure entered in De.1*)

Outcome

Health outcome: Click here to name the health outcome

Patient-reported outcome (PRO): Click here to name the PRO

*PROs include HRQoL/functional status, symptom/symptom burden, experience with care, health-related behaviors. (A PRO-based performance measure is not a survey instrument. Data may be collected using a survey instrument to construct a PRO measure.)*

Intermediate clinical outcome (*e.g., lab value*): Click here to name the intermediate outcome

Process: Completion of a nutrition assessment for patients identified to be at-risk of malnutrition from a completed malnutrition screening

Appropriate Use Measure: Click here to name what is being measured

Structure: Click here to name the structure

Composite: Click here to name what is being measured

**1a.2.** **LOGIC MODEL:** Diagram or briefly describe the steps between the healthcare structures and processes (e.g., interventions, or services) and the patient’s health outcome(s). The relationships in the diagram should be easily understood by general, non-technical audiences. Indicate the structure, process or outcome being measured.

Nutrition screening completed at admission can identify patients at risk of malnutrition early in the patient stay. Those patients who are identified are then assessed by a registered dietitian who, if appropriate, may recommend a specific nutrition intervention to address the patient’s malnutrition, which if addressed early can reduce risk of mortality and post-operative complications and possibly reduce length of stay.

**1a.3 Value and Meaningfulness: IF** this measure is derived from patient report, provide evidence that the target population values the measured ***outcome, process, or structure*** and finds it meaningful. (Describe how and from whom their input was obtained.)

**\*\*RESPOND TO ONLY ONE SECTION BELOW -EITHER 1a.2, 1a.3 or 1a.4) \*\***

**1a.2 FOR OUTCOME MEASURES including PATIENT REPORTED OUTCOMES - Provide empirical data demonstrating the relationship between the outcome (or PRO) to at least one healthcare structure, process, intervention, or service.**

**1a.3. SYSTEMATIC REVIEW(SR) OF THE EVIDENCE (for INTERMEDIATE OUTCOME, PROCESS, OR STRUCTURE PERFORMANCE MEASURES, INCLUDING THOSE THAT ARE INSTRUMENT-BASED) If the evidence is not based on a systematic review go to section 1a.4) If you wish to include more than one systematic review, add additional tables.**

**What is the source of the systematic review of the body of evidence that supports the performance measure? A systematic review is a scientific investigation that focuses on a specific question and uses explicit, prespecified scientific methods to identify, select, assess, and summarize the findings of similar but separate studies. It may include a quantitative synthesis (meta-analysis), depending on the available data. (IOM)**

Clinical Practice Guideline recommendation

US Preventive Services Task Force Recommendation

Other systematic review and grading of the body of evidence (*e.g., Cochrane Collaboration, AHRQ Evidence Practice Center*)

Other

|  |  |
| --- | --- |
| **Source of Systematic Review:**   * **Title** * **Author** * **Date** * **Citation, including page number** * **URL** | Mueller C, Compher C & Druyan ME and the American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) Board of Directors. A.S.P.E.N. Clinical Guidelines: Nutrition Screening, Assessment, and Intervention in Adults. J Parenter Enteral Nutr. 2011;35: 16-24.  <https://onlinelibrary.wiley.com/doi/epdf/10.1177/0148607110389335> |
| Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the  conclusions from the SR. | “Nutrition support intervention is recommended for patients identified by screening and assessment as at risk for malnutrition or malnourished. Grade C” (Page 22)  “Rationale - Nutrition support intervention in patients identified by screening and assessment as at risk for malnutrition or malnourished may improve clinical outcomes. This guideline places nutrition assessment and screening in the context of intervention as part of nutrition care. Nutrition intervention in malnourished patients was associated with improved nutrition status nutrient intake physical function and quality of life. In addition, hospital readmissions were reduced.” (Page 23) |
| Grade assigned to the **evidence** associated with the recommendation with the  definition of the grade | Grade C- Supported by at least 1 level II investigation  Level III Evidence: Nonrandomized cohort with contemporaneous controls. |
| Provide all other grades and definitions  from the evidence grading system | Level I Evidence: Large randomized trials with clear‐cut results; low risk of false‐positive (α) and/or false‐negative (β) error  Level II Evidence: Small, randomized trials with uncertain results; moderate to high risk of false‐positive (α) and/or false‐negative (β) error  Level IV Evidence: Nonrandomized cohort with historical controls  Level V Evidence: Case series, uncontrolled studies, and expert opinion |
| Grade assigned to the **recommendation**  with definition of the grade | C- Supported by at least 1 level II investigation |
| Provide all other grades and definitions  from the recommendation grading system | A- Supported by at least 2 level I investigations  B- Supported by 1 level I investigation  D- Supported by at least 1 level III investigation  E – Supported by level IV or V evidence |
| Body of evidence:   * Quantity – how many studies? * Quality – what type of studies? | 2 small, randomized trials  1 Nonrandomized cohort with contemporaneous  controls.  1 nonrandomized cohort with historic controls  1 uncontrolled observational study |
| Estimates of benefit and consistency  across studies | Nutrition intervention in malnourished patients was associated with improved nutrition status nutrient intake physical function and quality of life. In addition, hospital readmissions were reduced. |
| What harms were identified? | No adverse events were identified in this SR |
| Identify any new studies conducted since  the SR. Do the new studies change the conclusions from the SR? | Yes, additional studies since the publication of the original SR have demonstrated further evidence of the benefits of nutrition intervention for patients with malnutrition. The studies demonstrate the impact of timely nutrition intervention on 30-day readmission risk and hospital length of stay. |

**OTHER SYSTEMATIC REVIEW OF THE BODY OF EVIDENCE**

Milne AC, Potter J, Vivanti A, Avenell A. Protein and energy supplementation in elderly people at risk from malnutrition. Cochrane Database Syst Rev. 2009;(2):CD003288.

URL: http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003288.pub3/abstract?systemMessage=Wiley+Online+Library+will+be+unavailable+on+Saturday+14th+May+11:00-14:00+BST+/+06:00-09:00+EDT+/+18:00-21:00+SGT+for+essential+maintenance.Apologies+for+the+inconvenience

**FINDINGS FROM SYSTEMATIC REVIEW OF BODY OF THE EVIDENCE supporting the measure**

*If more than one systematic review of the evidence is identified above, you may choose to summarize the one (or more) for which the best information is available to provide a summary of the quantity, quality, and consistency of the body of evidence. Be sure to identify which review is the basis of the responses in this section and if more than one, provide a separate response for each review.*

**ESTIMATES OF BENEFIT AND CONSISTENCY ACROSS STUDIES IN BODY OF EVIDENCE**

**What are the estimates of benefit—magnitude and direction of effect on outcome(s) across studies in the body of evidence**? (*e.g., ranges of percentages or odds ratios for improvement/ decline across studies, results of meta-analysis, and statistical significance*)

Mueller et al. Findings fromClinical Guideline

|  |  |
| --- | --- |
| **Outcome of Interest** | **Study Findings from Review** |
| Body Composition | Norman (2008) study predicted significant improvement in body weight and body cell mass follow a three-month intervention of high-protein and energy supplements while Odeli (2005), found that patients managed using the nutrition care process experienced less weight loss (mean weight change -4.2 kg +/-6.4 cf. -8.9 kg +/- 5.9, P = 0.03) (Odeli, 2005). |
| Cost | Kruizenga (2005) found that, to shorten the mean length of hospital stay by 1 d for all malnourished patients, a mean investment of 76 euros (91 US dollars) in nutritional screening and treatment was needed. |
| Length of Stay (LOS) | Kruizenga (2005) found early screening and treatment of malnourished patients reduced the LOS in malnourished patients with low handgrip strength (i.e., frail patients) and another study found that patients managed using the NP had a shorter length of stay (3.2 days +/- 5.4 cf. 13.5 days +/- 14.1, P = 0.002) (Odeli 2005). |
| Muscle Function | Persson (2007) found that treated-as-protocol analyses showed that Katz ADL index improved in the I-group (p<0.001; p<0.05 between the groups). |
| Nutritional Intake | Babineau (2008) reported significant increases in energy (p=0.0001) and protein (p=0.01) intakes, and in serum albumin (p=0.001), prealbumin (p=0.003), transferrin (p=0.024), and hematocrit (p=0.026) levels. An additional study of standardized nutrition care added approximately 600 kcal and 12 g protein to the daily intake of malnourished patients (Kruizenga 2005) |
| Readmission | Norman (2008) study found dietary counselling patients experienced significantly more readmissions (n=20) than oral nutritional supplement patients (n=10) during the study period (p=0.041). One additional study found that fewer patients managed using standardized nutrition care had an unplanned hospital admission (46% cf. 75%, P = 0.04) (Odeli, 2005). |

Milne et al. Findings fromClinical Guideline

|  |  |
| --- | --- |
| **Outcome of Interest** | **Study Findings from Review** |
| Mortality | 48 included studies with a total of 8,031 participants when meta-analyzed, reported an overall relative risk (RR) of 0.92.    The subgroup analyses suggested that the results were statistically significant or approaching statistical significance when limited to trials in which participants (N = 2461) were defined as undernourished (RR 0.79), and when 400 kcal or more was offered per day in the supplement (N = 7307), (RR 0.89).    The results were consistent when analysis was restricted to 15 trials (N = 6604) with clearly concealed randomization (RR 0.91) |
| Cost | 24 trials with a total of 6,225 participants were meta-analyzed and overall, reported a statistically significant difference between intervention and control for risk of complications (RR=0.86).    In subgroup analyses, hip fracture patients were also at reduced risk of complications (RR=0.60). |
| Length of Stay (LOS) | 12 studies were meta-analyzed and pooled weighted mean difference for LOS using a random-effects model showed no benefit from supplementation -0.8 days (-2.8 to 1.3) with significant heterogeneity (chi-square 25.53; df 13; P = 0.02; I2 = 49%). Subgroup analyses for length of stay were too limited to suggest any difference between diagnostic groups. |
| Quality of Life | Few studies were able to provide data on improvements in functional status or quality of life in general, apart from handgrip data. Measures were too diverse or too limited to combine for meta-analyses. |

**What harms were studied and how do they affect the net benefit (benefits over harms)?**

18 trials discussed adverse effects from nutritional supplementation, but no studies compared intervention group with control groups. Problems with tolerance and side-effects were reported in 12 studies including nausea, vomiting and diarrhea in the intervention group.

**UPDATE TO THE SYSTEMATIC REVIEW(S) OF THE BODY OF EVIDENCE**

**Valladares AF, Kilgore KM, Partridge J, Sulo S, Kerr KW, McCauley S. How a malnutrition quality improvement initiative furthers malnutrition measurement and care: results from a hospital learning collaborative. JPEN J Parenter Enteral Nutr. Published online April 13, 2020.**

In this study, the implementation of malnutrition-focused quality improvement practices significantly improved the identification of malnutrition. The prompt identification and treatment of patients at malnutrition risk can improve patient care and health, as well as reduce costly readmissions. Improvements were observed for all 4 malnutrition quality measures. The greatest improvements were achieved as a result of timely nutrition assessment (P = .06) and malnutrition diagnosis (P = .02). Patients ≥65 years with a malnutrition diagnosis and nutrition care plan had a 24% lower likelihood of 30-day readmission but a longer mean LOS than did those without a care plan.

**Mullin GE, Fan L, Sulo S, Partridge J. The Association between Oral Nutritional Supplements and 30-Day Hospital Readmissions of Malnourished Patients at a US Academic Medical Center. J Acad Nutr Diet. 2019;119(7):1168-1175.**

Of 153,161 inpatient encounters analyzed, a total of 8,713 (5.7%) malnourished adults admitted to an academic medical center hospital in the United States between October 1, 2016, and September 30, 2017 were included in the analyses. Only 3.1% of malnourished patients received ONS. ONS users had 38.8% fewer readmissions compared with non-ONS counterparts (P¼0.017). The reduction in hospital readmissions by ONS was even greater for oncology patients (46.1%, P<0.001). A 50% reduction in time from hospital admission to ONS provision was associated with a 10.2% (P<0.01), 10.2% (P¼0.014), and 16.6% (P<0.01) decrease in LOS for overall, oncology, and intensive care unit encounters, respectively.

This study found that ONS intervention, when used, was associated with 38.8% fewer 30-day readmissions. This association was more pronounced for oncology encounters. Shorter LOS was observed when the interval between admission and ONS initiation was shorter.

**Sharma Y, et al. Investigation of the benefits of early malnutrition screening with telehealth follow up in elderly acute medical admissions. QJM. 2017 Oct 1;110(10):639-647.**

A randomized controlled trial, 148 malnourished patients were randomized to receive either a nutrition intervention for 3 months or usual care. Intervention included an individualized nutrition care plan plus monthly post-discharge telehealth follow-up whereas control patients received intervention only upon referral by their treating clinicians. Nutrition status was determined by the Patient Generated Subjective Global Assessment (PG-SGA) tool. Clinical outcomes included changes in length of hospital stay, complications during hospitalization, Quality of life (QoL), mortality and re-admission rate.

54 males and 94 females (mean age, 81.8 years) were included. Both groups significantly improved PG-SGA scores from baseline. There was no between-group differences in the change in PG-SGA scores and final PG-SGA scores were similar at 3 months 6.9 (95% CI 5.6-8.3) vs. 5.8 (95% CI 4.8-6.9) (P = 0.09), in control and intervention groups, respectively. Median total length of hospital stay was 6 days shorter in the intervention group (11.4 (IQR 16.6) vs. 5.4 (IQR 8.1) (P = 0.01). There was no significant difference in complication rate during hospitalization, QoL and mortality at 3-months or readmission rate at 1, 3 or 6 months following hospital discharge.

**Meehan A, Loose C, Bell J, Partridge J, Nelson J, Goates S. Health System Quality Improvement: Impact of Prompt Nutrition Care on Patient Outcomes and Health Care Costs. J Nurs Care Qual. 2016.**

Quality improvement program that positioned early nutritional care into the nursing workflow. Nurses screened formal nutrition risk at patient admission and then immediately ordered oral nutritional supplements for those at risk. Supplements were given as regular medications, guided and monitored by medication administration records.

Length of stay (-0.77 days or 13.4%), probability of readmissions (-17%) and cost of care (-$969 or 8.8%) were all reduced (p<0.01).

This observational study supports early intervention on patients who are found to be at-risk of malnutrition.

**Deutz NE, Matheson EM, Matarese LE, et al. Readmission and mortality in malnourished, older, hospitalized adults treated with a specialized oral nutritional supplement: A randomized clinical trial. Clinical nutrition (Edinburgh, Scotland). 2016;35(1):18-26**

A Multicenter, randomized, placebo-controlled, double-blind trial of 652 older (≥65 years), malnourished (Subjective Global Assessment [SGA] class B or C) adults hospitalized for congestive heart failure, acute myocardial infarction, pneumonia, or chronic obstructive pulmonary disease with inpatient and posthospital statuses received standard-of-care plus HP-HMB (n = 328) or a placebo supplement (n = 324), 2 servings/day. Primary composite endpoint was 90-day postdischarge incidence of death or nonelective readmission. Other endpoints included 30- and 60-day postdischarge incidence of death or readmission, length of stay (LOS), SGA class, body weight, and activities of daily living (ADL).

The primary composite endpoint was similar between HP-HMB (26.8%) and placebo (31.1%). No between-group differences were observed for 90-day readmission rate, but 90-day mortality was significantly lower with HP-HMB relative to placebo (4.8% vs. 9.7%; relative risk 0.49, 95% confidence interval [CI], 0.27 to 0.90; p = 0.018). The number-needed-to-treat to prevent 1 death was 20.3 (95% CI: 10.9, 121.4). Compared with placebo, HP-HMB resulted in improved odds of better nutritional status (SGA class, OR, 2.04, 95% CI: 1.28, 3.25, p = 0.009) at day 90, and an increase in body weight at day 30 (p = 0.035). LOS and ADL were similar between treatments.

**Snider JT, Jena AB, Linthicum MT, et al. Effect of hospital use of oral nutritional supplementation on length of stay, hospital cost, and 30-day readmissions among Medicare patients with COPD. Chest. 2015;147(6):1477-84.**

Retrospective cohort study identified hospitalizations in which ONS was provided, and used propensity-score matching to compare LOS, hospitalization cost, and 30-day readmission rates in a one-to-one matched sample of ONS and non-ONS hospitalizations.

One-to-one matched sample was created with 14,326 cases. In unadjusted comparisons in the matched sample, ONS use was associated with longer LOS (8.7 days vs 6.9 days, P < .0001), higher hospitalization cost ($14,223 vs $9,340, P < .0001), and lower readmission rates (24.8% vs 26.6%, P = .0116). However, in instrumental variables analysis, ONS use was associated with a 1.9-day (21.5%) decrease in LOS, from 8.8 to 6.9 days (P < .01); a hospitalization cost reduction of $1,570 (12.5%), from $12,523 to $10,953 (P < .01); and a 13.1% decrease in probability of 30-day readmission, from 0.34 to 0.29 (P < .01).

ONS may be associated with reduced LOS, hospitalization cost, and readmission risk in hospitalized Medicare patients with existing morbidities such as COPD.

**Cawood AL, Elia M, Stratton RJ. Systematic review and meta-analysis of the effects of high protein oral nutritional supplements. Ageing Res Rev. 2012;11(2):278-96.**

The review concluded that high protein oral nutritional supplements had significant clinical, nutritional and functional benefits in a range of patient groups and health settings.

The authors' conclusions are reasonable but considerable clinical diversity in the included studies causes some uncertainty as to their generalizability. This systematic review involving 36 randomized controlled trials (RCT) (n=3790) (mean age 74 years; 83% of trials in patients >65 years) and a series of meta-analyses of high protein ONS (>20% energy from protein) demonstrated a range of effects across settings and patient groups in favor of the high protein ONS group.

The outcomes analyzed in this meta-analysis support the conclusions made in the systematic review and guideline cited above which include reduced complications (odds ratio (OR) 0.68 (95%CI 0.55-0.83), p<0.001, 10 RCT, n=1830); reduced readmissions to hospital (OR 0.59 (95%CI 0.41-0.84), p=0.004, 2 RCT, n=546).

**Feldblum I et al. Individualized nutritional intervention during and after hospitalization: the nutrition intervention study clinical trial. J Am Ger Soc 2011; Jan;59(1):10-7**

Double-blind, randomized, placebo-controlled trial conducted from March 2001 to January 2004 of 225 hospitalized acutely ill older adults. Normal hospital diet plus 400-mL oral nutritional supplements daily for 6 weeks. The composition of the supplement was such as to provide 995 kcal for energy and 100% of the Reference Nutrient Intakes for a healthy older person for vitamins and minerals. Measurements were taken at baseline, 6-week, and 6-month nutritional status and quality of life.

Randomization to the supplement group led to significantly better quality-of-life scores than in the placebo group at 6 months but not at 6 weeks, after adjustment for baseline quality of life, age, and sex. The effect of supplementation was seen in higher physical function, role physical, and social function scores. Corresponding treatment effects were 7.0 (95% confidence interval (CI)=0.5-13.6, P=.04), 10.2 (95% CI=0.1-20.2, P=.047), and 7.8 (95% CI=0.0-15.5, P=.05), respectively. There was no evidence of difference in Barthel scores at 6 months.

**Somanchi M et al. The facilitated early enteral and dietary management effectiveness trial in hospitalized patients with malnutrition. JPEN 2011 Mar;35(2):209-16.**

A retrospective cohort analysis using demographic data, anthropometric measurements, LOS, and serum albumin levels were collected from 400 patients in 2 medical wards to determine the prevalence of malnutrition and potential delays in nutrition consultation. Based on these results, a nutrition intervention study was conducted in 1 ward; the other ward served as a control. Patients were classified as normally nourished or malnourished. Multivariate general linear regressions were used to reveal the impact of intervention on the change in LOS, controlling for other potential confounding factors on the cohort and a subset with severe malnutrition.

Of the 400 patients assessed, 53% had malnutrition. Multiple general linear regressions showed that nutrition intervention reduced LOS an average of 1.93 days in the cohort group and 3.2 days in the severe malnourished group. Case mix index and female gender were positively associated with LOS in the malnourished group. Nutrition intervention reduced the delays in implementing nutrition support to patients by 47%.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**1a.4 OTHER SOURCE OF EVIDENCE**

If source of evidence is NOT from a clinical practice guideline, USPSTF, or systematic review, please describe the evidence on which you are basing the performance measure.

**1a.4.1 Briefly SYNTHESIZE the evidence that supports the measure.** A list of references without a summary is not acceptable.

**1a.4.2 What process was used to identify the evidence?**

**1a.4.3. Provide the citation(s) for the evidence.**