

Question submitted to RapidInfo4U

What malnutrition screening tools are best for use with patients recovering from Covid-19 in acute and community settings?

Has any data been published, to show that these are effective in screening accurately for malnutrition?

Is there any potential for under-over diagnosis been reported with existing screening tools?

Answer

Clinical guidelines endorse use of validated tools for screening patients with or recovering from COVID-19. These guidelines also endorse the GLIM two-step approach where screening is first conducted to identify those at high risk of malnutrition and further assessment is conducted for those identified at risk of malnutrition. Guidelines and literature on malnutrition screening tools are often focused on acutely ill COVID-19 patients. MUST is commonly recommended for use in the community setting but guidelines suggest that various validated tools can be used.

The effectiveness of malnutrition screening tools considers a range of factors: how sensitive and specific the tools are as well as how well they perform compared to other validated measures and how well they predict patient outcomes. Within COVID-19 patients, the literature is limited. Many of the tools were found to have high sensitivity including the NRS-2002, MNA-SF, and MUST. This suggests that the tools are unlikely to miss those at risk of malnutrition. MUST may be slightly less sensitive but may be more specific - that is, it would be less likely to incorrectly identify someone as being at risk of malnutrition. However, the COVID-19 and broader literature on the utility of the nutrition screening tools is considered low quality and studies provide mixed estimates of their effectiveness.

Nutritional biomarkers have also been suggested to provide valid estimates of malnutrition. An additional consideration is the extent to which screening tools can be used remotely in the community setting. Practices for remote screening have been developed and recommended but the effectiveness of these approaches requires further evaluation.

Details of answer

Various screening tools have been used to assess risk of malnutrition in patients at various points during or post-COVID-19 infection. While there exists different tools for assessing malnutrition risk within the critical care context (see example from British Dietetic Association [here](#)), this response focuses on tools suitable for the acute and community setting. Firstly, this response will overview the screening tools recommended in COVID-19 guidelines. Secondly, literature on the effectiveness of these tools in the context of COVID-19 will be reported.

The following abbreviated nutrition screening tools are mentioned in this response:

Malnutrition Screening Tool (MST)

Malnutrition Universal Screening Tool (MUST)

Mini Nutritional Assessment (MNA)

Mini Nutritional Assessment – Short Form (MNA-SF)

Nutrition Risk Index (NRI)

Nutrition Risk Score 2002 (NRS-2002)

Guidelines and Process of using Nutrition Screening Tools with COVID-19 patients

In the 'ESPEN expert statements and practical guidance for nutritional management of individuals with SARS-CoV-2 infection', Barazzoni and colleagues (1) recommend the MUST criteria for screening vulnerable populations for developing COVID-19 and the NRS-2002 criteria for hospitalised patients. Through screening, if a person is identified as positive for malnutrition risk, further assessment tools are appropriate. These include the Subjective Global Assessment criteria and the MNA criteria validated for geriatric patients. The authors also highlight the consensus report from the Global Leadership Initiative on Malnutrition (GLIM) (2). This recommends a two-step approach: firstly screening for risk of malnutrition, then secondly, assessing to diagnose and establish severity of malnutrition.

The COVID-19 nutrition recommendations produced in Australia and New Zealand (3) endorse the use of validated screening tools for people with COVID-19 on acute wards. The authors list the MUST, MST and MNA-SF as examples of validated screening tools. The subsequent step in the nutrition care pathway depends on the screening results as in Table 1. As highlighted in Table 1, other criteria are considered alongside the screening tools. Those identified as high nutrition risk will undergo full nutritional assessment.

Table 1. Next step in care pathway according to nutrition screening result from Chapple and colleagues (3)

Nutrition Risk Screening	Subsequent care step
Low Nutrition Risk (MST \leq 1, MUST = 0 or <5% unintentional weight loss)	Managed by nursing staff or other suitably trained staff members as standard care
Moderate Nutrition Risk (MST = 2, MUST = 1 or 5-10% unintentional weight loss)	Referral to an Nutrition/Allied Health Assistant or Dietitian for additional simple interventions
High Nutrition Risk (Requirement for EN or PN or high risk condition or MST \geq 3, MUST \geq 2)	Referral to the Dietitian for a full nutritional assessment and individualised care plan

A review of COVID-19 nutrition support guidelines for COVID-19 in the community published in October 2020 (4) identified the screening tools that are commonly recommended in guidelines. MUST was most commonly recommended within the community setting. The 'Patients Association Nutrition Checklist' was indicated as being useful for older COVID-19 populations. This review of guidelines also highlights that nutritional assessment follows a positive screening for malnutrition risk.

The guidelines related to the use of nutrition screening tools with COVID-19 patients help contextualise the role of screening tools. They are often the first step in nutrition management to assess if there is a risk of malnutrition. Then based on the score or outcome of screening, various pathways may be followed. For those at high risk, a full assessment is needed to 'diagnose' and understand in greater depth the specific issues for the individual. In terms of screening tools, there are different indicators of their effectiveness. Sensitivity refers to the

instruments ability to identify those who are at nutritional risk (5). Specificity refers to the instruments ability to identify individuals who are not at nutritional risk (5). There are also measures of validity such as criterion validity that captures how similar the results of a tool are with another well validated measure or predictive validity that considers how well a tool predicts certain health outcomes.

[Evidence on the Performance of Nutrition Screening Tools](#)

The evidence on the effectiveness of nutrition screening tools in the context of COVID-19 is limited. However, some reviews have synthesised the available evidence, mainly in the context of older adults. A review of nutrition screening tools for older adults with COVID-19 was published in September 2020 (5). The review included four studies using the NRS-2002, MNA-SF, MUST, and NRI. The authors concluded that all tools had high sensitivity. The MUST had higher specificity than other instruments compared to body mass index. The MNA and MUST were found to have the best criterion validity – that is they were similar to other measures of malnutrition risk. However, the MNA-SF and NRS-2002 had good predictive validity (they were associated with outcomes like weight loss or length of stay). The overall conclusion was that all the tools were useful but none could be identified as the optimal tool.

A second review published in March 2021 also examined nutrition screening tools for use with adults with COVID-19, this time including 14 studies (6). These studies used traditional screening tools and some also used nutritional biomarkers. These biomarkers are then used to form indices or scores of nutrition risk. In this review, the NRS-2002 was found to be more sensitive than other screening measures. The controlling nutritional status (CONUT) score is calculated from lymphocyte count, total cholesterol, and serum albumin. The CONUT score and extensions of it were found to be better predictors of health outcomes than the NRS-2002. This led the authors to conclude that laboratory measures may be valuable alternatives to traditional screening tools for identifying COVID-19 patients at nutritional risk. However, much of this research was concentrated on those acutely ill from COVID-19 and not those recovering

from COVID-19. The MNA was used with patients recovering from COVID-19 in the hospital or community and MNA scores correlated with nutritional markers.

The broader literature comparing nutrition screening tools outside of COVID-19 patients also finds variable estimates of sensitivity and specificity of the screening tools. The recently developed Irish National Clinical Guideline in April 2020 (7) included a literature review in order to make recommendations around the use of nutrition screening tools in the acute setting. Specifically, the guideline states the following strong recommendation, though the quality of evidence is acknowledged to be very low: “Use a validated screening tool, e.g. Malnutrition Screening Tool (MST) or Malnutrition Universal Screening Tool (MUST), to screen for malnutrition risk in all adults admitted to acute hospitals.” (p.2). However, it is stated that if either the MNA-SF or NRS-2002 is already being used “there is no need to change practice” (p.2). This Guideline includes a systematic review comparing the screening tools in terms of detecting malnutrition risk and adverse clinical outcomes. The quality of the studies was very low and sensitivity of the tools was variable across studies. Ultimately, the decision on the tools to be prioritised in the Irish setting was informed by literature in conjunction with practical considerations such as tools already in use and supported by education in the Irish context. This led to selecting the MST and MUST tools. The outpatient setting was considered beyond the scope of this National Clinical Guideline.

Nutrition Screening Tools for Remote Use

A further consideration for nutrition screening tools in the community is the extent to which they can be used remotely. A number of guidelines suggested that subjective and recalled measurements could be used as part of MUST screening if physical measurements were not available as in remote consultations in the community setting (4). ‘A Community Healthcare Professional Guide to the Nutritional Management of Patients During and After COVID-19 Illness’ published by The Malnutrition Pathway in June 2020 outlines considerations for remote nutrition screening (See document [here](#)). The Guide recommends the use of validated

screening tools such as the MUST. If engaging in remote consultation and physical measures are not possible, it is recommended to “1. Use patient reported values of current weight, height, and previous weight to calculate Step 1 and Step 2 of ‘MUST’” and “2. Where it is not possible to obtain physical or self-reported measures of weight or height there are a series of subjective criteria that can be used to form a clinical impression of an individual’s malnutrition risk category”. The document outlines subjective criteria and questions that may be used to elicit this information (read full document [here](#)). A specific tool has been designed for remote nutrition screening known as the R-MAPP (Remote – Malnutrition APP) (8). It consists of the MUST as well as a 5-item questionnaire to provide information on sarcopenia - Strength, Assistance with walking, Rise from a chair, Climb stairs and Falls. Literature evaluating the impact of efficacy of tools used in remote screening was not found.

Conclusion

Many previously validated nutrition screening tools have shown sensitivity for identifying malnutrition risk in patients with COVID-19, though limited research has focused on patients recovering from COVID-19 or post-infection. The MUST tool may have less sensitivity and more specificity than other tools. Nutritional biomarkers were also found to be useful indicators of malnutrition risk. However, different tools performed well in terms of different measures of validity. Further research is needed, particularly on the remote use of nutrition screening tools.

Disclaimer

This document has not been peer-reviewed; it should not replace individual clinical judgement. The views expressed in this document are not a substitute for professional medical advice. The content of this document is correct as of 31/05/21

Rapid Evidence Search & Summary (RESS)

Our team of multidisciplinary researchers and clinicians in conjunction with the University of Limerick Library and Information Services have developed a detailed protocol for conducting a Rapid Evidence Search & Summary (RESS) to answer questions submitted to RapidInfo4U. Our RESS protocol uses PICO or PEO methods to refine your question and follows a detailed search procedure capturing guidance

documents from governments, institutions and professional bodies; searching clinical and COVID specific repositories; and identifying the most recent reviews and RCTs in the scientific literature using established databases.

References

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