



Malnutrition Screening on Admission: Why a Two-Minute Tool Keeps Being Skipped

Ferran Casals-Riera^{1*}, Marthe Devos² and Ingeborg Rasch³

¹Department of Clinical Nutrition, Ebro Institute of Human Nutrition, Logrono, Spain

²Department of Nutrition and Dietetics, Hainaut Institute of Nutritional Medicine, Mons, Belgium

³Department of Nursing Science, Thuringian Institute of Nutritional Medicine, Jena, Germany

*Correspondence to: Ferran Casals-Riera, Department of Clinical Nutrition, Ebro Institute of Human Nutrition, Logrono, Spain

E-mail: f.casalsriera@eihn.es

Received: 16 January 2022; Accepted: 08 July 2022; Published: 06 November 2022

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Abstract

Nutrition screening on admission takes about two minutes and is recommended within twenty-four hours by every major guideline, yet audit repeatedly finds it incomplete. In one admission audit of 197 patients, 39 per cent had a primary screening recorded and 21 per cent were screened within twenty-four hours; a survey of 1,777 practitioners found 36.7 per cent completing screening at admission, 50.8 per cent within twenty-four hours and 69 per cent documenting the result. The premise of the title is only partly right, and two findings complicate it. Screening is not uniformly skipped: one Australian series screened 207 of 208 patients on admission while only a third were rescreened weekly. And where screening is completed, action frequently does not follow, with 27.1 per cent of patients identified at risk receiving nutritional support in one point prevalence study. The instruments also disagree sharply, identifying between 23.8 and 85.7 per cent of the same 420 patients as at risk.

Keywords: Malnutrition screening; NRS-2002; MUST; Hospital malnutrition; Implementation

Introduction

Malnutrition is common among hospital inpatients and is associated with longer stay, more complications, higher readmission and increased mortality [1,2,3,29,30]. The problem was described in general medical inpatients half a century ago and again two decades later, with little change in the interval [29,30]. A screening survey of 564,063 patients reported that a positive score was associated with a stay 1.4 days longer [31]. Screening on admission is the step by which those at risk are meant to be identified, and every major society recommends it within twenty-four hours of admission and weekly thereafter [4,5,6].

The instruments are short. The Nutritional Risk Screening 2002, the Malnutrition Universal Screening Tool and the Malnutrition Screening Tool each take a few minutes, require no laboratory test, and can be completed by nursing staff at the bedside [7,8,9,20]. Subjective global assessment, by contrast,

requires trained assessors and a fuller set of questions [20]. There is no technical obstacle to performing them.

Audit nonetheless finds screening incomplete across many settings. This review examines how incomplete, whether the failure is uniform, what happens after a positive screen, and how far the tools agree with one another.

Objective

This review sets out to establish three things from the published literature. First, what proportion of admitted patients are actually screened, and within what interval. Second, whether the tools in use identify the same patients. And third, what follows a positive screen, since a screening programme that identifies risk without altering care delivers nothing.

Literature Review

How often screening is performed: An audit at a Danish medical department included 197 patients of median age 74 years. On the audit day, 76 (39 per cent) had a primary screening recorded and 42 (21 per cent) had been screened within twenty-four hours (Figure 1) [10]. A survey of 1,777 practitioners reported that 36.7 per cent completed nutrition screening at admission and 50.8 per cent within twenty-four hours, with 69 per cent documenting the findings in the medical record [11].

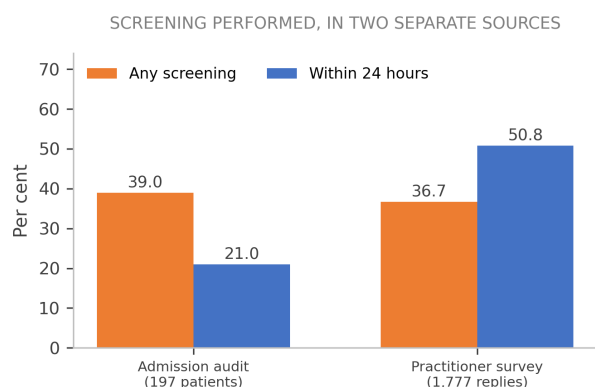


Figure 1: Screening performed, in an admission audit and a practitioner survey [10,11]

Where it is performed well: The picture is not uniform. A study of patients with hospital-acquired malnutrition in Australian public hospitals found that nutrition screening was undertaken shortly after admission for almost all patients, 207 of 208, while only one third were screened weekly thereafter, and patients with longer stays were screened less often than those with shorter ones [12]. Admission screening and repeat screening are therefore separate problems with separate rates.

The tools do not agree: A cross-sectional study screened 420 adult inpatients at three referral hospitals within twenty-four hours of admission. The Nutritional Risk Screening 2002 identified 85.7 per cent as at risk, the Malnutrition Screening Tool 71.7 per cent and the Malnutrition Universal Screening Tool 51.0 per cent, while body mass index alone classified 23.8 per cent (Figure 2). Both NRS-2002 and MUST showed sensitivity of 1.000 against the reference standard, but MUST had higher specificity at 0.65 and better overall discrimination, with an area under the curve of 0.82. The investigators concluded that NRS-2002 tended to overestimate risk [13].

Table 1: Performance of four screening approaches applied to the same 420 patients [13]

Table 2: Completion at each stage of the screening pathway, as reported

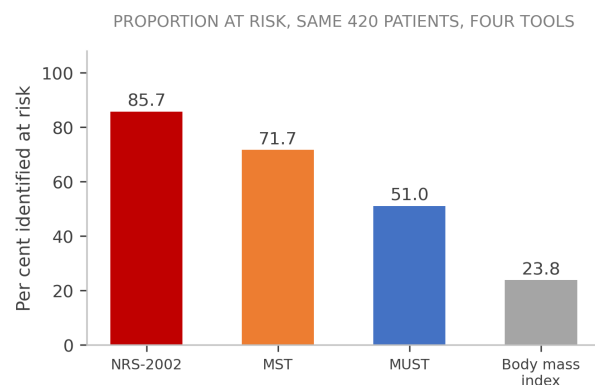


Figure 2: Proportion identified at risk in the same 420 patients, by tool [13]

Tool	At risk	Sensitivity	Specificity
NRS-2002	85.7%	1.000	lower
Malnutrition Screening Tool	71.7%	—	—
MUST	51.0%	1.000	0.65
Body mass index alone	23.8%	—	—

Reported prevalence varies with the setting as well as the tool: A prospective study of 537 adults at a tertiary hospital, screened at twenty-four hours with four instruments against subjective global assessment, found an overall undernutrition rate of 47.3 per cent, rising to 54.2 per cent in those over 65 [14]. A point prevalence study of 178 inpatients found 24.7 per cent at risk, higher in surgical clinics at 32.3 per cent than in internal medicine at 20.3 per cent [15]. A multi-country cohort of 2,126 adults across South Africa, Kenya and Ghana found 61 per cent at risk on admission (Figure 6) [16].

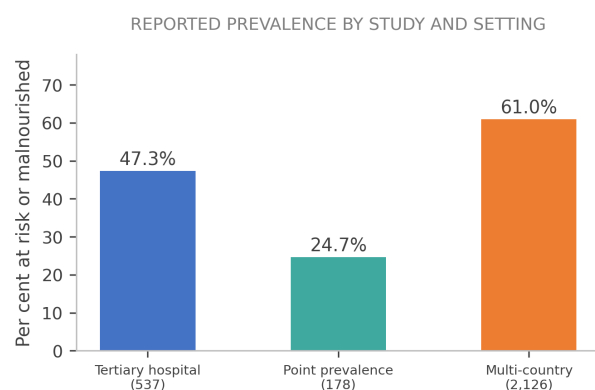


Figure 6: Reported prevalence by study and setting [14,15,16]

What happens during the admission: In that multi-country cohort, risk of malnutrition rose from 61 per cent on admission to 71.2 per cent at discharge, 20.6 per cent of patients lost 5 per cent or more of body weight during the stay, and discharge body mass index was significantly lower than admission body mass index (Figure 4) [16]. A systematic review of hospital-acquired malnutrition reported that between 10 and 65 per cent of patients experienced nutritional decline during admission [12].

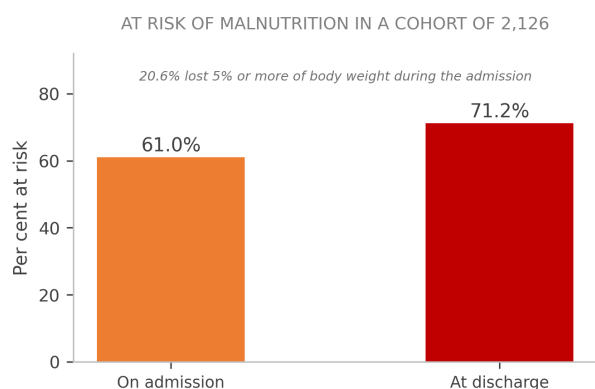


Figure 4: Risk of malnutrition on admission and at discharge in 2,126 adults [16]

What follows a positive screen: In the multi-country cohort, 18.8 per cent of patients were referred for nutrition support [16]. In the point prevalence study, only 27.1 per cent of patients identified as at risk received nutritional support, 19 per cent in surgical clinics and 44 per cent in internal medicine (Figure 3) [15].

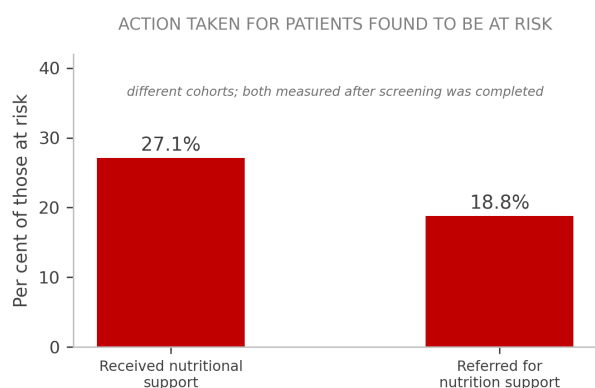


Figure 3: Action taken for patients identified as at risk [15,16]

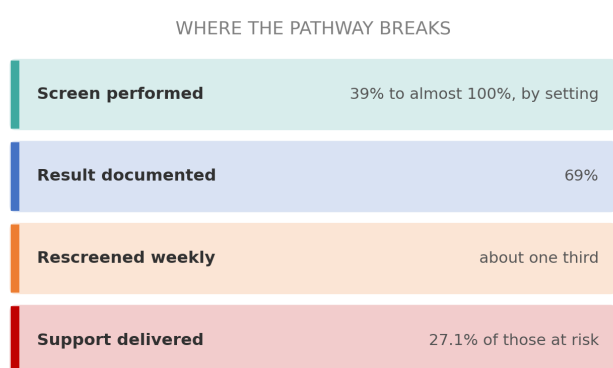


Figure 5: Where the pathway breaks, across the studies reviewed [10,11,12,15]

Stage of the pathway	Reported completion
Screen performed on admission	39% to 207 of 208, by setting [10,12]
Screened within 24 hours	21% to 50.8% [10,11]
Result documented	69% [11]
Rescreened weekly	About one third [12]
Support delivered to those at risk	27.1% [15]

Why it is not done: A systematic review identified competing clinical priorities as the primary obstacle to ongoing screening, and reported that nutrition intervention tends to be reactive rather than proactive. Frequently reported barriers to nutritional adequacy during admission included mealtime interruptions, procedure-related fasting, the effects of illness or treatment, chewing difficulty and poor appetite [12,17]. Qualitative work with hospital staff describes the same obstacles from the practitioner side [34], and a large European survey found wide variation in how nutritional risk was assessed and managed between countries [27].

What screening is meant to lead to: Screening identifies risk; diagnosis requires a further step. The GLIM framework makes that sequence explicit, requiring a validated screening tool as the first stage before phenotypic and aetiologic criteria are applied [18,26]. Comparison of NRS-2002 and MUST as the first step in that sequence found that patients screened as unaffected by one tool were identified by the other, so the choice of first-stage instrument propagates into the diagnosis [26].

Consequences measured at scale: An undernutrition screening survey of 564,063 patients reported that those with a positive screening score stayed in hospital 1.4 days longer than those without [31]. Comparative analysis of screening and diagnostic tools as predictors of hospitalisation cost found that the instruments differ in how well they perform that role as well [32]. The case for screening therefore rests on a real association, whichever tool is used to establish it [1,2,21].

Screening in the emergency department: A proportion of admissions are screened, if at all, at the point of entry rather than on the ward, and nutritional screening with anthropometry has been examined specifically in patients admitted from emergency departments [24]. That setting compresses the time available and competes with acute assessment, which is the same pressure the systematic review identified as displacing repeat screening on the ward [12,24].

Performance differs by population: The instruments were developed in general inpatients and behave differently elsewhere. Screening performance has been assessed separately in geriatric rehabilitation, where the Mini Nutritional Assessment and the Patient-Generated Subjective Global Assessment were compared against criterion validity, in hospitalised chronic kidney disease, and in inflammatory bowel disease, where NRS-2002 and MUST were tested as the first stage of a diagnostic sequence [25,26,33]. A tool that performs well in one population is not thereby validated in another, and the systematic review of screening tools for the hospital setting concluded that no single instrument suits every purpose [22].

Method

Search strategy: PubMed and the archives of the major clinical nutrition, dietetics and general medical journals were searched for studies of nutrition screening in hospital inpatients. Search terms combined nutrition screening and malnutrition screening with admission, NRS-2002, MUST, completion, barriers and hospital-acquired malnutrition. Reference lists of the systematic review [12] and the principal guidelines [4,5] were screened by hand for primary sources [28]. Diagnostic frameworks applied after screening, notably the GLIM criteria, were consulted for context [18,19,26].

Eligibility: Studies were included if they reported the proportion of patients screened, compared screening instruments in a defined population, or reported what followed a positive screen. Guideline documents are cited for their recommendations and identified as such.

Data extraction and handling: Setting, population, instrument, threshold and the reported proportion were extracted as published. The instrument and its threshold are stated alongside every prevalence figure, because the same patients yield prevalence estimates differing more than threefold depending on the tool applied, and that variation is central to the argument here. This review reports published findings and does not constitute guidance on the nutritional management of any individual patient. No pooling or re-analysis was performed. Figures 1 to 6 and Tables 1 to 3 reproduce published values only. This is a narrative synthesis of published literature and was not registered as a systematic review.

Concluding Remarks

The title of this review states a common belief, and the evidence supports it only in part. Screening completion of 39 per cent in one audit and 36.7 per cent in a large practitioner survey is consistent with a tool being skipped [10,11]. But an Australian series screened 207 of 208 patients on admission, which shows the task is achievable at scale, and in the same series only a third were rescreened weekly [12]. Admission screening and repeat screening fail at different rates and probably for different reasons.

The more uncomfortable finding sits downstream. In the point prevalence study, 27.1 per cent of patients identified as at risk received nutritional support, and in the multi-country cohort 18.8 per cent were referred [15,16]. A screening programme completed perfectly would still leave most identified patients untreated at those rates. Effort directed entirely at screening completion addresses the more visible half of the problem.

The disagreement between instruments deserves stating plainly because it affects every prevalence figure in this literature. Applied to the same 420 patients, four approaches returned 85.7, 71.7, 51.0 and 23.8 per cent [13]. Prevalence of nutritional risk is therefore substantially a property of the

instrument chosen [21,22,32], and comparisons between hospitals using different tools are comparisons of tools as much as of populations.

What the evidence does support without qualification is that nutritional status deteriorates during admission. Risk rose from 61 to 71.2 per cent between admission and discharge in one cohort, a fifth of patients lost 5 per cent or more of their body weight, and a systematic review found nutritional decline in between 10 and 65 per cent of patients [12,16]. That happens after admission screening has been done or not done, and it is the outcome any screening programme exists to prevent.

Two limitations belong with these conclusions. The studies are heterogeneous in setting, instrument and threshold, and are drawn from health systems with very different staffing and dietetic provision, so the completion rates are not directly comparable [10,11,13]. And no study reviewed here randomised patients to screening against no screening with clinical outcomes as the endpoint, so the benefit of screening itself is inferred from the association between malnutrition and outcome rather than demonstrated [1,3,12,21]. Screening performance also differs by population, having been examined separately in geriatric rehabilitation, in emergency admissions, in chronic kidney disease and in inflammatory bowel disease [23,24,25,33]. Prevalence estimates from national surveys differ again from single-centre figures [31,32].

A practical observation follows from the pattern of the completion figures. Screening on admission is a single discrete task attached to a moment that already carries a documentation burden, and it reaches high completion where it is built into that moment [12]. Weekly rescreening has no such anchor: it belongs to no particular event, falls to whoever is on the ward, and is the step that fails most consistently, particularly for the long-stay patients whose risk is highest [12,16].

That distinction matters because nutritional deterioration accrues over the admission rather than being present at the door. A fifth of patients in the multi-country cohort lost 5 per cent or more of body weight while in hospital, and risk rose by ten percentage points between admission and discharge [16]. Admission screening cannot detect what has not yet happened, so a programme judged solely on its admission completion rate is being measured on the half of the task least able to prevent the outcome [12,29].

There is a measurement point that bears on how any of this is audited. A service recording only whether a screen was completed cannot distinguish a screen done and acted upon from one done and filed, and the documentation figure of 69 per cent suggests the two diverge [11]. Auditing completion alone will therefore report improvement as documentation improves, whether or not any patient is treated differently [11,15].

What would settle more than another prevalence survey is a study linking the screening result to what was done next and to

what happened to the patient. The association between malnutrition and outcome is well established, and the association between a positive screen and a longer stay has been measured in more than half a million patients [1,2,31]. What has not been shown is that changing the screening rate changes the outcome, and that is the claim on which screening programmes are justified [12,21].

A final observation about what the completion figures can and cannot be compared with. The audit reporting 39 per cent and the survey reporting 36.7 per cent measure different things: one counts screens present in the record on a single day, the other counts practitioners reporting their own usual practice [10,11]. Self-report tends to run ahead of documented practice, so the closeness of those two numbers is coincidental rather than corroborative, and neither is a national rate.

Set against the Australian series screening 207 of 208 patients, the range across these studies is wide enough that a single figure for how often screening happens would misrepresent all of them [10,11,12]. What is consistent across settings is the shape rather than the level: admission screening outperforms repeat screening, documentation outperforms action, and the patients who stay longest are screened least often while being at greatest risk of the deterioration the programme exists to detect [12,16].

Acknowledgements

The authors thank the audit teams whose completion figures made the size of this gap measurable, and the investigators who reported what happened after a positive screen rather than stopping at the screening rate.

Funding

No dedicated funding from public, commercial or charitable sources supported the preparation of this review.

Conflict of Interest

The authors declare no competing interests.

Ethics Statement

This article reviews previously published studies only. No new patient data were collected and no participants were recruited, so ethical approval was not required.

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Citation: Casals-Riera F, Devos M, Rasch I. "Malnutrition Screening on Admission: Why a Two-Minute Tool Keeps Being Skipped." *J Clin Nutr Heal* (2022);3: 001-006