

## PROCESS AND SYSTEMS Under-identification of cancer outpatients at risk of malnutrition: are we making the most of anthropometric data?

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### ABSTRACT

In oncological outpatient settings, patients often require nutritional support after they have developed malnutrition. A delayed dietetic referral can lead to increased difficulties in providing therapies and surgery, and to poorer patient outcomes. The audit described in this article aimed to assess the frequency and completeness of patient record documentation of anthropometric measurements in a day treatment unit (DTU) in a single cancer centre in the UK. The underlying goal was to improve anthropometry monitoring procedures to ensure that documentation is sufficient to indicate weight loss and, hence, allow timely referrals for nutrition support. The results show that, for over 80% of patients, it was not possible to identify a weight trend between the latest two treatments received at the hospital. The audit findings highlight the need to improve malnutrition monitoring and to ensure patient records contain updated and accurate anthropometric measurements in order to facilitate medical staff to recognise early malnutrition risk and refer for appropriate nutritional support when needed.

**KEYWORDS:** malnutrition, audit, cancer, anthropometric measures

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### Introduction

Malnutrition is a deficiency or imbalance of energy or nutrients, resulting in measurable adverse effects on body composition, function and clinical outcomes.<sup>1</sup> Malnutrition is a prevalent and severe problem among cancer patients, the development of which can contraindicate treatments including surgery and radio- or chemotherapy.<sup>2</sup> Consequent significant weight loss or body composition alterations can affect quality of life, mobility

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and treatment efficacy.<sup>3</sup> Therefore, in oncology settings, patients' anthropometrics must be recorded as early as possible.

Anthropometric measurements are used in healthcare to assess the size and proportions of the human body. Clinical compliance with current National Institute for Health and Care Excellence (NICE), Early Career Faculty The European Society for Clinical Nutrition and Metabolism (ESPEN) and BAPEN guidelines on anthropometric data recording is the foundation of many important clinical interventions.<sup>4–7</sup> Although more sophisticated technologies are available, weight and height remain the easiest, quickest and cheapest measures for most patients. Where these are not measurable with regular scales (eg wheelchair users), limb length or hoist weighing scales can provide a substitute. Body mass index (BMI) can be derived from weight and height, and used with sex, age or pathology to estimate energy and nutrients requirements. Anthropometrics are commonly used to predict and assess the risks associated with the disease and to make prognoses. In oncology, they can be used to determine fitness for treatment or surgery, and to calculate medicine dosages.<sup>8</sup> This audit assessed the completeness of anthropometric documentation in patient records within a single day treatment unit (DTU).

### Methods

Using alphabetical randomisation (first 25 patients for each letter by surname), anthropometric values (weight, height and BMI) of 430 cancer patients (representing 60% of patients) who attended the DTU during 3 weeks in June 2020 were checked. Digital records were assessed for whether height and weight were documented, at any time and on the DTU visit. Measurement from the DTU visit was compared against the weight of their previous appointments in order to identify weight changes (loss or gain) over time. Additionally, referrals to dietitians were noted. The data recording was measured against the NICE standards, which indicate that 100% of weight measures should have been recorded.<sup>6</sup> The audit was registered online in the trust register for clinical audits. No ethical approval was required.

### Results

Missing weight data from either or both visits meant it was not possible to identify a weight trend between the latest two appointments for 81% (349/430) of patients, despite their attendance at hospital visits (Table 1).

Despite the lack of documentation, 62 patients (14%) were referred to dietitians for malnutrition risk (BMI <18.5 kg/m<sup>2</sup>, and weight loss >5% in the last month or >10% in the last 3 months). These appropriate referrals confirm the expertise of staff and the delivery of nutrition support.

Of the remaining 82 patients with weight trend data, 33% presented with either 5% weight loss in the last month or 10% weight loss in the last 6 months or a BMI below 18 kg/m<sup>2</sup>. These patients would meet at least one of the ASPEN criteria for malnutrition and, therefore, could have been considered for dietetic referral.

## Discussion

In this audit, one-third of outpatients with a cancer diagnosis who were screened for weight changes were identified to be losing weight. Absence of, and inconsistencies in, data recording is evident, with fewer than one in five patients regularly monitored for weight changes and approximately one in three with height misrecorded. The results of this audit are similar to others published in the UK.<sup>9,10</sup>

This audit was planned before the COVID-19 pandemic as anecdotal evidence suggested electronic medical records were incomplete. No routine nutritional screening occurs in the DTU; the responsibility is on staff to refer patients for nutritional care according to their medical records.

Documenting anthropometrics may have been hindered during the pandemic. All appointments were in person; however, staff were under increased pressure in their role, including understaffing as a result of absences due to COVID-19. Lack of staff training may also have affected documentation rates. Culturally, nutrition can be seen as secondary in the care of cancer patients, with healthcare professionals prioritising medication and disease treatment.<sup>11</sup>

Protocol dictates that height must be measured before the start of treatment; nevertheless, inconsistencies in documented height may be a result from use of self-reported rather than measured height due to either lack of time or equipment.

Data from a reliable and regularly compiled database of only the most basic anthropometric measurements could have great utility for medical staff and pharmacists.<sup>12</sup> It would allow drug dosage to be calibrated correctly, it would be an indicator for nurses and oncologists for treatment tolerance and side effects, and it would allow patients to monitor their anthropometric status before surgery. It would also allow for an easier and earlier referral for nutrition support.

It is predicted that up to one-third of all patients may be losing weight, equating to around 240 patients a month in this single centre. Previous studies in the UK suggest that missed dietetic referrals are a nation-wide issue, which, if data from this audit are extrapolated to the entire cancer population nationally attending DTU, could involve tens of thousands of patients.<sup>12,13</sup> Increased efforts towards regular monitoring of weight in cancer outpatients and the subsequent early detection of malnutrition should become a priority. Attending a clinical setting (such as hospitals) provides an opportunity for patients to be fully monitored and referred to the appropriate service as early as possible. If used correctly, anthropometric data recording could be a simple but invaluable resource for cancer settings as well as other clinical settings that have a high prevalence of malnutrition, such as dialysis centres and hepatology clinics.

**Table 1. Patient anthropometry data**

Measures	Patients, n (%)
Weight recorded on DTU visit	207/430 (48)
Weight recorded on previous DTU visit	236/430 (60)
Height recorded on medical records	387/430 (90)
Inconsistent height on medical records <sup>a</sup>	81/387 (19)
Updated BMI on medical records	12/430 (3)

<sup>a</sup>Differences of more than 5 cm over time. BMI = body mass index; DTU = day treatment unit.

Following this audit, a plan has now been made to prepare and deliver educational material for staff in the DTU, including a poster to raise awareness, and nutrition starter packs for staff to distribute to patients. Additionally, a re-audit has been planned in order to monitor the effectiveness of the improvement measures.

A limitation of this audit is the timing in relation to the pandemic, which could have been a confounding factor. Furthermore, it was not possible to investigate other factors (such as the pattern of referrals) due to the nature of the audit design. However, the number of patients, which is representative of the population, strengthens the findings.

## Conclusion

Weight and height are simple, low-cost and non-invasive measures. Nevertheless, as with any human measurement, they are subject to error, bias, and inter- and intra-observer errors. In the era of e-health and development of artificial intelligence capable of predicting pathologies and prognoses by working on personal health data, NHS staff cannot afford to overlook the documentation of patients' weight and height using electronic systems.<sup>14</sup> With the current technology and automation, digital systems used in the NHS could be set to remind the assessor to record anthropometric data as well as to automatically calculate BMI, monitor weight loss and potentially generate referrals. These simple additions to IT systems could reduce human error, avoid misleading records and reduce staff workload. It could also be used more effectively for research, be linked with patients' prognosis and outcomes, and improve communication across the healthcare team.

Complete and accurate anthropometric data would also allow flowcharts or protocols for early nutritional interventions. Referrals would then become proactive rather than reactive and the onus on single members of staff would be reduced. The current approach would, therefore, largely benefit from becoming more systematic and effective.

Future work should examine whether the combination of increased healthcare professionals' awareness of malnutrition issues and the development of IT tools to record anthropometric data to locate inconsistencies or omissions could improve clinical practice, patient care and quality of life. ■

## References

- 1 World Health Organization. *Malnutrition*. WHO, 2021. [www.who.int/news-room/fact-sheets/detail/malnutrition](http://www.who.int/news-room/fact-sheets/detail/malnutrition)

- 2 Ryan AM, Power DG, Daly L *et al*. Cancer-associated malnutrition, cachexia and sarcopenia: The skeleton in the hospital closet 40 years later. *Proc Nutr Soc* 2016;75:199–211.
- 3 Lim SL, Ong KCB, Chan YH *et al*. Malnutrition and its impact on cost of hospitalization, length of stay, readmission and 3-year mortality. *Clin Nutr* 2012;31:345–50.
- 4 National Institute for Health and Care Excellence. *Suspected cancer: recognition and referral: NICE Guideline [NG12]*. NICE, 2021 [www.nice.org.uk/guidance/NG12](http://www.nice.org.uk/guidance/NG12)
- 5 Powell-Tuck J, Gosling P, Lobo DN *et al*. *British consensus guidelines on intravenous fluid therapy for adult surgical patients: GIFTASUP*. BAPEN, 2007
- 6 Arends J, Bachmann P, Baracos V *et al*. ESPEN guidelines on nutrition in cancer patients. *Clin Nutr* 2017;36:11–48.
- 7 Arends J, Baracos V, Bertz H *et al*. ESPEN expert group recommendations for action against cancer-related malnutrition. *Clin Nutr* 2017;36:1187–96.
- 8 Ravasco P. Nutrition in cancer patients. *J Clin Med* 2019;8:1211.
- 9 Wheatley P. Report of a nutritional screening audit. *Journal of Human Nutrition and Dietetics* 1999;12:433–6.
- 10 Hickson M, Hill M. Implementing a nutritional assessment tool in the community: a report describing the process, audit and problems encountered. *Journal of Human Nutrition and Dietetics* 1997;10:373–377.
- 11 Spiro A, Baldwin C, Patterson A, Thomas J, Andreyev HJN. The views and practice of oncologists towards nutritional support in patients receiving chemotherapy. *Br J Cancer* 2006;95:431–4.
- 12 Lorton CM, Griffin O, Higgins K *et al*. Late referral of cancer patients with malnutrition to dietitians: a prospective study of clinical practice. *Support Care Cancer* 2020;28:2351–60.
- 13 Baldwin C, McGough C, Norman AR, Frost GS, Cunningham DC, Andreyev HJN. Failure of dietetic referral in patients with gastrointestinal cancer and weight loss. *Eur J Cancer* 2006;42:2504–9.
- 14 Akbarov A, Kontopantelis E, Sperrin M *et al*. Primary Care Medication Safety Surveillance with Integrated Primary and Secondary Care Electronic Health Records: A Cross-Sectional Study. *Drug Saf* 2015;38:671–82.

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