



**Clinical
Oncology
Society of
Australia**

**CANCER-RELATED MALNUTRITION AND
SARCOPENIA POSITION STATEMENT:
IMPLEMENTATION TOOLKIT**

About COSA

The Clinical Oncology Society of Australia (COSA) is Australia's peak multidisciplinary society for health professionals working in cancer research, treatment, rehabilitation and palliative care. COSA is recognised as an activist organisation whose views are valued in all aspects of cancer care. We are allied with and provide high-level clinical advice to Cancer Council Australia. The overarching mission of COSA is to improve the care of Australians affected by cancer. In order to improve cancer care and control in Australia COSA seeks to (as defined in the Constitution; approved 14 November 2017):

- Promote excellence in the multidisciplinary care and research relating to cancer – from prevention, diagnosis and treatment to follow-up, palliation and survivorship;
- Encourage multidisciplinary collaboration of all professionals involved in cancer care and research;
- Foster and promote cancer research;
- Support the professional development and educational needs of cancer health professionals in the furtherance of the above objects.

The Cancer-Related Malnutrition and Sarcopenia Position Statement Implementation Toolkit was produced by a multidisciplinary Working Group of COSA members, under the guidance of the COSA Nutrition Group chaired Ms Jenelle Loeliger and project dietitian Ms Jane Stewart.

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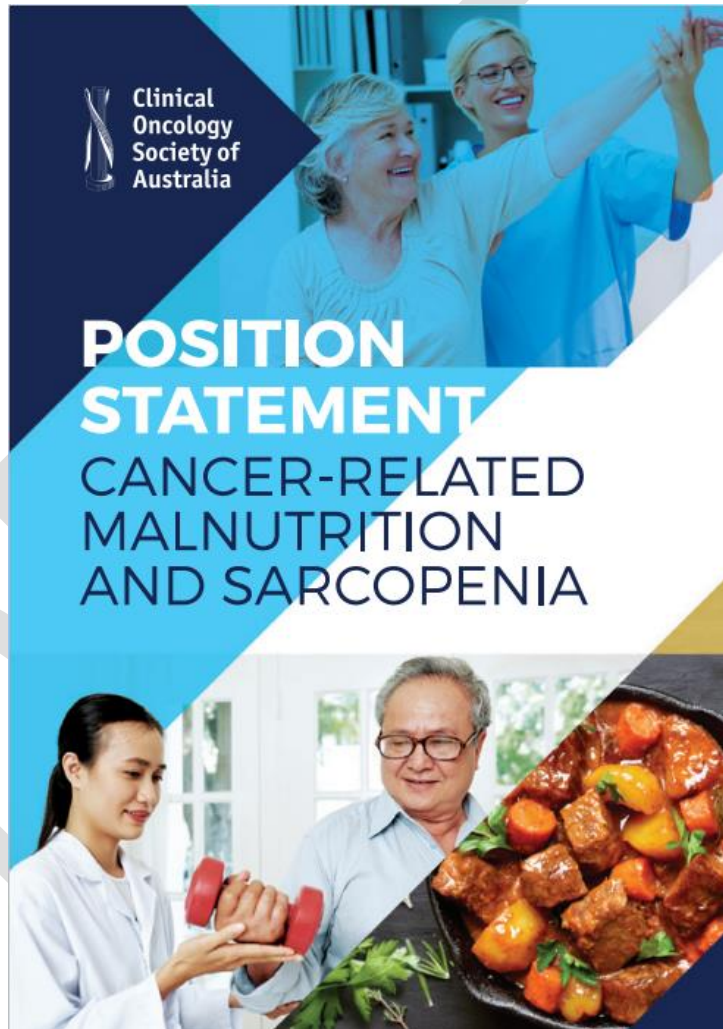
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DRAFT

Background

In 2020 the Clinical Oncology Society of Australia (COSA) published a position statement on cancer-related malnutrition and sarcopenia. The document outlines the position of COSA on the role of health professionals and health services in recognising and treating patients with cancer-related malnutrition and sarcopenia.

This toolkit provides practical resources and guidance to support the implementation of the COSA position statement recommendations on cancer-related malnutrition and sarcopenia, into practice.





About the toolkit

Toolkit purpose

This toolkit is intended for use by clinicians and health services to educate and train clinicians, raise awareness, develop the services required and advocate for resources to support optimal management of cancer-related malnutrition and sarcopenia.

How the toolkit was developed

The toolkit was developed by members of the COSA cancer-related malnutrition and sarcopenia working group. The project was completed over 8 months and comprised 3 stages.

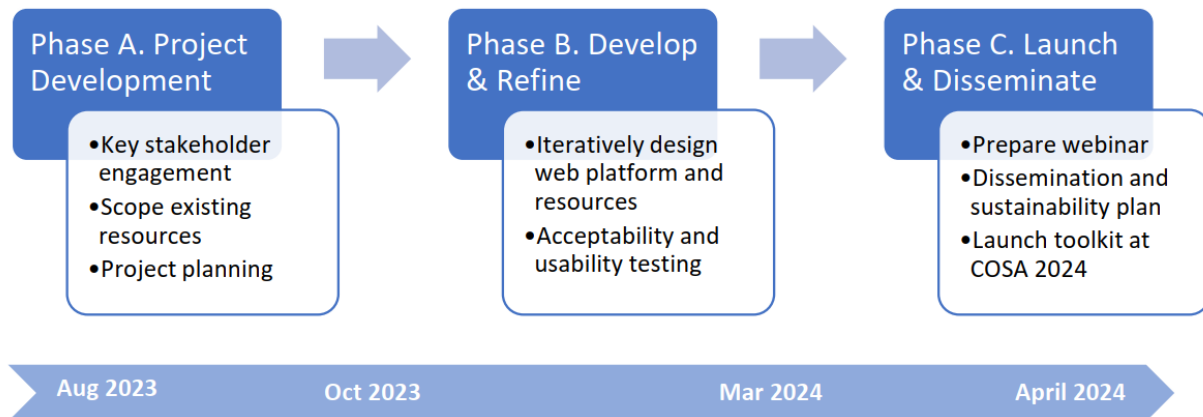


Figure 1: Summary of project phases and timelines

Resources were iteratively developed and refined over 2-3 workshops with working group members and clinicians. Once developed, the toolkit underwent usability and acceptability testing with multidisciplinary clinicians from across Australia.

The toolkit was funded by an educational grant from Abbott Australasia.

How to use the toolkit

The toolkit can be downloaded as one PDF document. In addition, the toolkit is available on the Nutrition Group page of the COSA website where each section of the toolkit is available and individual resources can be accessed/downloaded directly from the webpage. This toolkit is not intended to be exhaustive and is a concise and practical collation of new and existing tools and resources. Please refer to the COSA position statement on cancer-related malnutrition and sarcopenia document for further details.



Screening

Position statement recommendations

All people with cancer should be screened for malnutrition in all health settings at diagnosis and repeated as the clinical situation changes, using a screening tool that is valid and reliable in the setting in which it is intended.

All people with cancer should be screened for sarcopenia at diagnosis and repeated as the clinical situation changes, using the validated screening tool SARC-F or SARC-F in combination with calf-circumference.

Which screening tools to use

Malnutrition

The following screening tools have been shown to be valid and reliable for identifying malnutrition in people with cancer. The MST and MUST are most commonly used in Australia and can be self-administered or completed by any health professional.

- *Malnutrition Screening Tool (MST)*

Ferguson M, Capra S, Bauer J, Banks M. Development of a valid and reliable malnutrition screening tool for adult acute hospital patients. *Nutrition*. 1999 Jun;15(6):458-64. doi: 10.1016/s0899-9007(99)00084-2. ([Pub Med](#))

- *Malnutrition Universal Screening Tool (MUST)*

Stratton RJ, Hackston A, Longmore D, Dixon R, Price S, Stroud M, King C, Elia M. Malnutrition in hospital outpatients and inpatients: prevalence, concurrent validity and ease of use of the 'malnutrition universal screening tool' ('MUST') for adults. *Br J Nutr*. 2004 Nov;92(5):799-808. doi: 10.1079/bjn20041258. ([Pub Med](#))

- *Malnutrition Screening Tool for Cancer Patients (MSCT)*

Kim JY, Wie GA, Cho YA, Kim SY, Kim SM, Son KH, Park SJ, Nam BH, Joung H. Development and validation of a nutrition screening tool for hospitalized cancer patients. *Clin Nutr*. 2011 Dec;30(6):724-9. doi: 10.1016/j.clnu.2011.06.001. ([Pub Med](#))

- *Patient-Generated Subjective Global Assessment short form (PG-SGA SF)*

Abbott J, Teleni L, McKavanagh D, Watson J, McCarthy AL, Isenring E. Patient-Generated Subjective Global Assessment Short Form (PG-SGA SF) is a valid screening tool in chemotherapy outpatients. *Support Care Cancer*. 2016 Sep;24(9):3883-7. doi: 10.1007/s00520-016-3196-0. ([Pub Med](#))

Screening for malnutrition can be bypassed for people with a cancer diagnosis or treatment plan known to lead to high risk of malnutrition (see Table 1).

Table 1: Factors indicative of high risk of malnutrition

| <i>Cancer diagnosis</i> | <i>Treatment</i> | <i>Other</i> |
|--------------------------------------|---|------------------------|
| Head and neck | Radiation therapy to oral cavity or gastrointestinal tract | Advanced stage disease |
| Upper or lower gastrointestinal | Chemotherapy, immunotherapy, or targeted therapy with risk of gastrointestinal toxicity | Older age (>65 years) |
| Thoracic | Stem cell transplant | |
| Acute leukemia (myeloid or lymphoid) | Surgery to the oral cavity or gastrointestinal tract | |
| | Steroid use with treatment | |

Sarcopenia

The SARC-F has recently been validated for use in people with cancer, either alone or in combination with measurement of calf circumference.

The sensitivity and specificity of the SARC-F plus calf circumference are not very high (55.1%, 76.4%, respectively) in people with cancer.¹ This means as a screening tool it will falsely identify around 45% of people as ‘at risk’ and miss about 25% of people who are ‘at risk.’ The SARC-F used on its own has an even lower sensitivity (22.4%) but high specificity (92.1%) meaning it will incorrectly classify a high proportion (~78%) of people as ‘at risk’ but is good at identifying who is not ‘at risk.’¹ There are no tools currently available with both high sensitivity and specificity, therefore the SARC-F with or without calf circumference may be used but health professionals should be aware of the limitations.

- **SARC-F**

Malmstrom TK, Miller DK, Simonsick EM, Ferrucci L, Morley JE. SARC-F: a symptom score to predict persons with sarcopenia at risk for poor functional outcomes. *J Cachexia Sarcopenia Muscle*. 2016 Mar;7(1):28-36. doi: 10.1002/jcsm.12048. Epub 2015 Jul 7. ([Pub Med](#))

- **SARC-F in combination with calf-circumference (SARC-CalF)**

Yang M, Hu X, Xie L, Zhang L, Zhou J, Lin J, Wang Y, Li Y, Han Z, Zhang D, Zuo Y, Li Y, Wu L. Screening Sarcopenia in Community-Dwelling Older Adults: SARC-F vs SARC-F Combined With Calf Circumference (SARC-CalF). *J Am Med Dir Assoc*. 2018 Mar;19(3):277.e1-277.e8. doi: 10.1016/j.jamda.2017.12.016. ([Pub Med](#))

Relevant resources

- **The Online interactive MST**

The online interactive MST has been translated and culturally adapted in 10 languages other than English. It can be accessed at www.petermac.org/MST

Exemplars of evidence-based care in practice

The following case studies have been developed as exemplars of evidence-based care in practice. It is hoped they will help to support the implementation of the position statement recommendations into practice.

Raising awareness of malnutrition and sarcopenia in your organisation

| Implementation of an innovative model of nutrition care in patients with head and neck cancer | |
|--|---|
| WHAT did the initiative involve? | <p><i>This study aimed to implement and evaluate the integration of a patient-centred, best-practice dietetic model of care into a head and neck cancer (HNC) multidisciplinary team (MDT) to minimise the detrimental sequelae of malnutrition. Patients were identified via the weekly MDT meeting lists. Key interventions included:</i></p> <ul style="list-style-type: none"> <i>• A supportive care-led pre-treatment clinic providing targeted pre-treatment assessment, intervention, education and counselling to patients and caregivers.</i> <i>• A nutrition care dashboard served to highlight nutrition care processes and clinical outcomes and was integrated into the existing HNC Radiation Oncology list for discussion at weekly MDT meetings</i> |
| WHO was involved in the initiative? | <i>Medical (radiation/medical oncologists, surgeons), nursing and allied health professionals (dietitians, speech pathologists, psychologists and radiation therapists)</i> |
| WHERE did the initiative occur? | <i>Radiotherapy outpatient setting and HNC MDT meeting Royal Prince Alfred Hospital and Chris O'Brien Lifehouse</i> |
| WHO was the target of the initiative? | <i>Adult patients (≥18 years) undergoing radiotherapy +/- other treatment modality of curative intent for HNC</i> |
| WHEN was the initiative performed? | <i>Pre-treatment and during treatment</i> |
| HOW was the initiative undertaken? | <i>The 24-month project was funded by a research grant and consisted of three phases covering pre-implementation (ten months), implementation (eight months) and analysis (six months).</i> |
| OUTCOMES | <i>Post-implementation data demonstrated improved process and clinical outcomes: pre-treatment dietitian assessment; use of a validated nutrition assessment tool before, during and after treatment. Patients receiving the new model of care were significantly more likely to complete prescribed radiotherapy and systemic therapy. At the system level, the new model of care avoided 3.92 unplanned admissions and related costs of \$AUD121K per annum.</i> |
| REFERENCE | <i>Findlay M, et al. Best Evidence to Best Practice: Implementing an Innovative Model of Nutrition Care for Patients with Head and Neck Cancer Improves Outcomes. Nutrients. 2020 May 19;12(5):1465.</i> |

Incorporating malnutrition or sarcopenia screening into existing supportive care screening processes

| Monitoring malnutrition risk utilising the Malnutrition Screening Tool embedded into an Electronic Health Record | |
|---|---|
| WHAT did the initiative involve? | <i>The project aimed to test the feasibility of:</i> 1) <i>Operationalising and standardising malnutrition risk assessment across 2 large ambulatory cancer centers by embedding the Malnutrition Screening Tool (MST) into the electronic health record</i> 2) <i>Utilising MST aggregate data reports to identify and quantify the prevalence of patients at risk of malnutrition</i> |
| WHO was involved in the initiative? | <i>MST work standards were developed by the oncology Dietitians and approved by nursing and medical staff for MST administration at every oncology provider visit with a medical doctor or nurse practitioner. Registered nurses or medical assistants verbally administered the MST to patients during their intake assessment in the examination room at each clinic visit.</i> |
| WHERE did the initiative occur? | <i>Two large adult ambulatory community cancer centers in the Health Partners health system in the upper Midwest of the United States.</i> |
| WHO was the target of the initiative? | <i>Outpatient adult patients being treated for cancer by either the medical or radiation oncology departments</i> |
| WHEN was the initiative performed? | <i>April 2017 to December 2018</i> |
| HOW was the initiative undertaken? | <i>This was conducted as a quality assurance performance improvement project</i> |
| OUTCOMES | <i>Incorporating the MST into the EHRs to standardise malnutrition screening is feasible in 2 large outpatient cancer centers. An average 74% of patients were screened for malnutrition each month using the MST embedded into the EHR. An average of 5% and 12% of patients with cancer being treated medically and with radiation, respectively, were identified to be at nutritional risk with an MST score of ≥ 2.</i> |
| REFERENCE | <i>Trujillo EB, Shapiro AC, Stephens N, Johnson SJ, Mills JB, Zimmerman AR, Spees CK. Monitoring Rates of Malnutrition Risk in Outpatient Cancer Centers Utilizing the Malnutrition Screening Tool Embedded into the Electronic Health Record. J Acad Nutr Diet. 2021 May;121(5):925-930.</i> |

Improving your model of care to ensure timely identification of sarcopenia

| Development and Feasibility of an Inpatient Cancer-Related Sarcopenia Pathway | |
|--|--|
| WHAT did the initiative involve? | <p>The project aimed to:</p> <ol style="list-style-type: none"> 1. <i>Develop an evidence-based care pathway for the identification and management of cancer-related sarcopenia.</i> 2. <i>Test feasibility of the pathway in an inpatient cancer ward.</i> <ul style="list-style-type: none"> • <i>Screening was completed by Nutrition Assistants using the Sarc-F in combination with calf circumference</i> • <i>Clinical assessment measures were completed by both dietitians (PG-SGA, BIS) and physios (5-CST, AKPS).</i> • <i>Diagnosis using EWGSOP2 criteria.</i> |
| WHO was involved in the initiative? | <i>Nutrition, physiotherapy, allied health assistant clinicians and research clinicians from Peter MacCallum Cancer Centre. Experts in cancer nutrition and exercise oncology/sarcopenia from Deakin university</i> |
| WHERE did the initiative occur? | <i>Inpatient ward setting (medical oncology) Peter MacCallum Cancer Centre</i> |
| WHO was the target of the initiative? | <i>Adult patients (>18 years) with cancer admitted to a medical oncology ward</i> |
| WHEN was the initiative performed? | <i>During inpatient admission. Patients could be before, during or after treatment.</i> |
| HOW was the initiative undertaken? | <i>Local quality improvement project conducted over 4 months</i> |
| OUTCOMES | <p><i>n=159</i></p> <p><i>99.4% pts approached consented</i></p> <p><i>30.2% were at risk/had sarcopenia</i></p> <p><i>The screening and assessment components were delivered as intended, however low completion of assessment measures were observed for muscle mass (BIS, 20.5% and 5-CST, 50%). The sarc-pathway was acceptable to patients and health professionals.</i></p> |
| REFERENCE | <i>Loeliger J, Edbrooke L, Daly RM, Stewart J, Bucci L, Puskas C, Fitzgerald M, Baguley BJ, Kiss N. Development and Feasibility of an Inpatient Cancer-Related Sarcopenia Pathway at a Major Cancer Centre. Int J Environ Res Public Health. 2022 Mar 29;19(7):4038.</i> |

Implementing self-screening for malnutrition risk

| Patient-led screening using the Malnutrition Screening Tool (MST) | |
|--|--|
| WHAT did the initiative involve? | <p>Two studies were conducted to assess:</p> <ul style="list-style-type: none"> • The reliability of patient-led MST screening through assessment of inter-rater reliability between patient-led and dietitian-researcher-led screening and intra-rater reliability between an initial and a repeat patient screening. • The concurrent validity of patient-led MST against the Subjective Global Assessment (SGA) and the <u>interrater reliability</u> of patient-led MST against dietitian-led MST |
| WHO was involved in the initiative? | Dietitians |
| WHERE did the initiative occur? | Ambulatory cancer care services at a metropolitan tertiary hospital in Queensland. |
| WHO was the target of the initiative? | Patients attending ambulatory cancer care services for chemotherapy, radiotherapy or supportive treatments |
| WHEN was the initiative performed? | <ul style="list-style-type: none"> • October 2016 • May - June 2017 |
| HOW was the initiative undertaken? | Two single-site cross-sectional studies undertaken with a convenience sample of patients (n=208, and n=201) |
| OUTCOMES | <p>High inter-rater reliability and intra-rater reliability were observed. Agreement between patient-MST and dietitian-MST was 96%, with “almost perfect” chance-adjusted agreement. Agreement between repeated patient-MSTA and patient-MSTB was 94%, with “almost perfect” chance-adjusted agreement. Patient-led screening with the MST is reliable and well accepted by patients.</p> <p>The ability of the patient-led MST scores (0 to 1 vs 2 to 5) to indicate nutrition status was found to have a sensitivity of 94%, a specificity of 86%. Patient-led MST screening is a reliable and valid measure that can accurately identify ambulatory cancer care patients as at risk or not at risk of malnutrition.</p> |
| REFERENCES | <p>Di Bella A, Croisier E, Blake C, Pelecanos A, Bauer J, Brown T. Assessing the Concurrent Validity and Interrater Reliability of Patient-Led Screening Using the Malnutrition Screening Tool in the Ambulatory Cancer Care Outpatient Setting. <i>J Acad Nutr Diet.</i> 2020 Jul;120(7):1210-1215.</p> <p>Di Bella A, Blake C, Young A, Pelecanos A, Brown T. Reliability of Patient-Led Screening with the Malnutrition Screening Tool: Agreement between Patient and Health Care Professional Scores in the Cancer Care Ambulatory Setting. <i>J Acad Nutr Diet.</i> 2018 Jun;118(6):1065-1071.</p> |

Improving completion rates for malnutrition screening

| Improving the Performance of Nutrition Screening Through a Series of Quality Improvement Initiatives | |
|---|--|
| WHAT did the initiative involve? | <p>The study aimed to assess the effect of a series of quality improvement initiatives in improving the referral process and the overall performance of the 3-Minute Nutrition Screening (3-MinNS) tool.</p> <p>Annual audits were carried out on 4,467 patients. Performance gaps were identified and addressed through interventions, including (1) implementing a nutrition screening protocol, (2) nutrition screening training, (3) nurse empowerment for online dietetics referral of at-risk cases, (4) a closed-loop feedback system.</p> |
| WHO was involved in the initiative? | Members of the dietetic and nursing teams |
| WHERE did the initiative occur? | The inpatient setting at National University Hospital, Singapore |
| WHO was the target of the initiative? | Adult patients with cancer |
| WHEN was the initiative performed? | 2008-2013 |
| HOW was the initiative undertaken? | This study was conducted as a series of quality improvement initiatives |
| OUTCOMES | <p>In 2008 and 2009, nutrition screening error rates were 33% and 31%, with 5% and 8% blank or missing forms. For patients at risk of malnutrition, referral to dietetics took up to 7.5 days, with 10% not referred at all.</p> <p>After the interventions, non-referrals decreased to 7% (2010), 4% (2011), and 3% (2012 and 2013), and the mean turnaround time from screening to referral was reduced significantly from 4.3 +/- 1.8 days to 0.3 +/- 0.4 days ($p < .001$). Error rates were reduced to 25% (2010), 15% (2011), 7% (2012), and 5% (2013), and the percentage of blank or missing forms was reduced to and remained at 1%.</p> <p>Quality improvement initiatives were effective in reducing the incompleteness and error rates of nutrition screening and led to sustainable improvements in the referral process of patients at nutritional risk.</p> |
| REFERENCE | Lim SL, Ng SC, Lye J, Loke WC, Ferguson M, Daniels L. Improving the performance of nutrition screening through a series of quality improvement initiatives. <i>Jt Comm J Qual Patient Saf.</i> 2014 Apr;40(4):178-86. |

Role of the oncologist and surgeon

| What is the role of the Oncologist and Surgeon? | |
|--|--|
| SITUATION | <p>For medical clinicians, including oncologists and surgeons, it is important to consider appropriate care on an individual basis, even when it may not be immediately obvious a patient may be either at risk of, or already presenting with, cancer-related malnutrition and/or sarcopenia. Consider the following clinical scenarios:</p> <p>A patient with a diagnosis of...</p> <ol style="list-style-type: none"> 1. ...colorectal cancer, initially presenting with bowel obstruction prior to undergoing adjuvant chemotherapy. The patient reports increased bowel frequency (x4 per day for 3-5 days) post chemotherapy and a prolonged period of poor oral intake (2-3 weeks), fasting for tests/surgery and is now struggling with fatigue. An oncologist might recommend referral to dietetics for review and nutritional counselling. Referral to rehabilitation services to address fatigue and likely muscle wasting 2. ...breast cancer undergoing neoadjuvant chemotherapy prior to surgery with major reconstruction planned. The patient indicates low energy levels despite a slight gain in weight. Their performance status is decreasing with chemotherapy resulting in their oncologist deciding to reduce their chemotherapy dose. An oncologist might recommend referral for rehabilitation to address fatigue and declines in performance status 3. ...lung cancer who has undergone a lobectomy and is reporting fatigue, loss of strength and declining function. An oncologist might recommend a period of rehabilitation due to possible reduced cardiovascular fitness, loss of muscle mass and decreasing motivation prior to commencing chemotherapy. |
| WHAT care should be provided? (Action) | <p>As a clinical lead within the MDT, an oncologist or surgeon has an important role in facilitating the identification and management of malnutrition and sarcopenia. Depending on your role, here are some suggestions for what action you can take:</p> <p>Individual Level</p> <ul style="list-style-type: none"> <input type="checkbox"/> Gather enough information to determine if a patient may be at risk, particularly paying attention to any recent changes in their status/symptoms. <input type="checkbox"/> Be aware of local services and refer at-risk patients early eg. dietitian, exercise physiologist, physiotherapist. <input type="checkbox"/> Be able to give evidence-based, basic advice to at-risk patients whilst they are awaiting further assessment. <p>Team Level</p> <ul style="list-style-type: none"> <input type="checkbox"/> Consider where there are the opportunities an oncologist might take to raise awareness amongst their peers/other MDT members e.g. team meetings, journal clubs, conferences, research collaborations. |

| | |
|--|--|
| | <ul style="list-style-type: none"> <input type="checkbox"/> <i>Lead and facilitate structured multidisciplinary care pathways and referral processes that support behaviour change and adherence to evidence-based recommendations.</i> <p>Organisational/System Level</p> <p>To support uptake of the position statement in practice and policy:</p> <ul style="list-style-type: none"> <input type="checkbox"/> <i>Support development of systems to identify barriers and facilitators.</i> <input type="checkbox"/> <i>Promote and advocate for adequate resources to deliver evidence-based care. Consider how, where and by whom services will be provided when new services are planned, or existing services are expanded etc. This is particularly relevant for those in clinical/organisational and professional leadership roles.</i> |
| WHO should deliver care? (Actor) | <ul style="list-style-type: none"> • An oncologist or surgeon plays a key role in early referral to relevant multidisciplinary team members (e.g. dietitian, exercise physiologist, nurse, physiotherapist, psychologist, social work) for further assessment and treatment. |
| WHERE should care be delivered? (Context) | <ul style="list-style-type: none"> • An oncologist or surgeon should be aware of referral processes for local services according to the stage of patient care e.g. inpatient, outpatient, community etc. |
| WHO should receive care? (Target) | <ul style="list-style-type: none"> • All people with cancer should be screened for malnutrition and sarcopenia in all health settings at diagnosis and as the clinical situation changes throughout treatment and recovery. |
| WHEN should care be provided? (Time) | <ul style="list-style-type: none"> • At diagnosis, before treatment, during treatment, post treatment and surveillance. |
| OUTCOMES | <ul style="list-style-type: none"> • Any patient consult is an opportunity for all members of the multidisciplinary team (MDT) to consider whether a patient may be at risk of cancer-related malnutrition and/or sarcopenia and take appropriate action to facilitate early identification and treatment. |
| FURTHER READING | <ul style="list-style-type: none"> • <i>Kiss, N., et al., Clinical Oncology Society of Australia: Position statement on cancer-related malnutrition and sarcopenia. Nutr Diet, 2020. 77(4): p. 416-425.</i> • <i>Kiss, N., et al., Awareness, perceptions and practices regarding cancer-related malnutrition and sarcopenia: a survey of cancer clinicians. Support Care Cancer, 2020. 28(11): p. 5263-5270.</i> |

Patient case studies

Prehabilitation

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|---|--|
| <p>SITUATION</p> | <p>39M refugee “John Smith”, recently moved to rural NSW with no English language skills (all interactions required interpreter), diagnosed with upper gastrointestinal cancer requiring neo-adjuvant treatment at tertiary referral hospital for a period of 5 weeks and further pre-habilitation in his local community prior to surgery.</p> |
| <p>WHAT care was provided? (Action)</p> | <ul style="list-style-type: none"> • Initial malnutrition screening: <ul style="list-style-type: none"> - Presented to hospital with oesophageal dysphagia and suspected malnutrition, for feeding tube insertion and treatment planning. - Weight on admission 45kg with history of 20kg weight loss (33%) in 3-6 months. MST completed: score of 4. - Referral to dietitian and speech pathologist • Initial nutrition assessment: <ul style="list-style-type: none"> - PG-SGA completed – score 16C, identified at risk of refeeding syndrome - Weight 45.2kg - Speech pathologist conducted swallowing assessment and recommended soft diet and thin fluids. - Commenced on soft HPHE diet - Patient requested food from home as hospital food not culturally appropriate • Rescreening: <ul style="list-style-type: none"> - weekly MST during admission performed by nursing staff. • Nutrition review: <ul style="list-style-type: none"> - Monday – Friday during inpatient admission - Day 8 post admission -recommendation for NGT insertion due to inadequate oral intake and regurgitation of food - patient not keen. - Day 15 post admission – patient agreeable to NGT insertion, increased risk of refeeding syndrome. - Patient transferred to rural hospital close to home for allied health input, including dietitian for continuation of NG feeds - Regular review by Oncology dietitian (2x/week) during neo-adjuvant chemotherapy and radiation at tertiary referral cancer service - Patient returned home to rural setting with support from local community dietitian, social work and refugee service following handover of nutrition plan by Oncology Dietitian. • Multidisciplinary care: <ul style="list-style-type: none"> - Clear communication required between surgical MDT, oncology MDT and rural health care professionals. |
| <p>WHO delivered the care? (Actor)</p> | <ul style="list-style-type: none"> • Malnutrition screening – nursing staff |

| | |
|--|---|
| | <ul style="list-style-type: none"> • Nutrition assessment and review – <i>hospital dietitian, specialist oncology and community dietitian</i> • Symptom management – <i>medical staff</i> • Multidisciplinary care - <i>social work, speech pathologist, interpreter service and refugee service</i> |
| WHERE was the care delivered? (Context) | Inpatient and outpatient setting Metropolitan Tertiary referral hospital, rural NSW hospital and home care. |
| WHO received care? (Target) | Adult patient undergoing neo-adjuvant treatment |
| WHEN was care provided? (Time) | <ul style="list-style-type: none"> • Initial screening – <i>day 1 of inpatient admission</i> • Initial nutrition assessment – <i>day 6 of inpatient admission</i> • Rescreening – <i>weekly during admission and neo-adjuvant treatment</i> • Nutrition review – <i>at regular intervals during the diagnostic, neo-adjuvant treatment and prehabilitation period of care</i> |
| OUTCOMES | The patient was able to optimise nutritional intake with the use of early intervention NGT feeding and therefore proceeded with curative intent chemo-radiation. |

DRAFT

Haematology inpatient

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|---|---|
| <p>SITUATION</p> | <p>60F “Mary” electively admitted for a Melphalan Autologous Stem Cell Transplant (AutoSCT) on b/g of IgG kappa Multiple Myeloma.</p> |
| <p>WHAT care was provided? (Action)</p> | <ul style="list-style-type: none"> • Initial malnutrition screening: <ul style="list-style-type: none"> - <i>Malnutrition universal screening tool (MUST) completed by nursing staff within 8hrs of admission</i> - <i>Referred to dietitian for MUST score of 2 (high risk due to unintentional 5-10% LOW within the past 3-6 months)</i> • Initial nutrition assessment: <ul style="list-style-type: none"> - <i>PG-SGA = 15B</i> - <i>Mary had been weight stable for the past ~1/12 however had a gradual 5% LOW within the 5/12 prior with signs of mild lean muscle and subcutaneous fat depletion.</i> - <i>Mary was eating well at the time of assessment and meeting his nutritional requirements with only a mild reduction in appetite since admission and no other nutrition impact symptoms.</i> • Repeat malnutrition screening: <ul style="list-style-type: none"> - <i>MUST was repeated by nursing staff weekly on ‘Wednesday weight day’.</i> • Nutrition reviews: <ul style="list-style-type: none"> - <i>Mary was reviewed regularly by nutrition (from D0 onwards)</i> - <i>This included a Nutrition Assistant (NA) review as part of a lunchtime ‘meal round’ which involved documenting how much of his meal (incl. any oral nutrition supplements) he consumed.</i> • Repeat nutrition assessment: <ul style="list-style-type: none"> - <i>PG-SGA was repeated by the dietitian and included a physical assessment ensuring oedema was checked given the high occurrence of fluid retention in haematology patients which can mask LOW and detection of muscle wastage.</i> - <i>Mary’s oral intake gradually declined during her neutropenic phase with nutrition impact symptoms including reduced appetite, nausea, vomiting, mucositis, dysgeusia, and diarrhoea. This resulted in a gradual 3kg (3.5%) LOW prior to the initiation of supplemental nutrition.</i> • Interventions: <ul style="list-style-type: none"> - <i>Tailoring of hospital meals and assistance with texture modification due to mucositis with the help of the dietitian and nutrition assistant.</i> - <i>Addition of HEHP items from the supplemental menu.</i> - <i>Trial and consumption of oral nutrition supplement drinks</i> - <i>Initiation of parenteral nutrition (PN) to supplement nutrition. Mary was unable to tolerate enteral nutrition due to severe mucositis, nausea, vomiting and significant diarrhoea in the setting of neutropenic colitis.</i> - <i>Education was provided on the importance of optimal nutrition, the presence of increased requirements during a transplant, and the</i> |

| | |
|--|---|
| | <i>recommendation for strict food safety practices while immunocompromised.</i> |
| WHO delivered the care? (Actor) | <ul style="list-style-type: none"> • Malnutrition screening - <i>nursing staff</i> • Nutrition assessment and review - <i>dietitian & nutrition assistant</i> • Symptom management - <i>medical staff</i> • Food service - <i>menu monitors</i> |
| WHERE was the care delivered? (Context) | <p>Acute inpatient setting</p> <p>The Alfred Hospital – a major tertiary metropolitan hospital in Melbourne</p> |
| WHO received care? (Target) | Adult inpatient admitted for a SCT |
| WHEN was care provided? (Time) | <ul style="list-style-type: none"> • Initial screening - <i>completed by within 8hrs of admission</i> • Initial nutrition assessment - <i>completed prior to stem cell transplant (D-5)</i> • Rescreening - <i>weekly</i> • Nutrition review - <i>every 1-4 days</i> • Repeat nutrition assessment (PG-SGA) - <i>weekly</i> |
| OUTCOMES | <p>By ensuring appropriate protocols and initiatives are in place to support regular screening and rescreening as part of usual care, changes in nutritional status can be detected early. In this case, nutrition support was commenced prior to the patient developing hospital acquired malnutrition and prevented any further LOW from occurring in hospital.</p> <p>By screening for malnutrition risk early, the dietitian can proactively implement strategies and educate patients to optimise their nutrition before they become unwell. Following this with regular rescreening and assessments, the dietitian was able to confidently advocate for nutrition escalation with the multidisciplinary team, resulting in better outcomes for the patient.</p> |

Reference:

1. Fu X, Tian Z, Thapa S, Sun H, Wen S, Xiong H, Yu S. Comparing SARC-F with SARC-CalF for screening sarcopenia in advanced cancer patients. Clin Nutr. 2020 Nov;39(11):3337-3345. doi:10.1016/j.clnu.2020.02.020.



Assessment

Position statement recommendations

All people with cancer identified as being 'at risk' of malnutrition following appropriate screening or with a cancer diagnosis or treatment plan known to lead to high risk of malnutrition should have comprehensive nutrition assessment using a tool validated in the oncology population.

All people with cancer identified as being 'at risk' of sarcopenia following appropriate screening should have a comprehensive evaluation of muscle status using a combination of assessments for muscle mass, muscle strength and function.

Interpretation of diagnostic criteria for sarcopenia should be applied recognising that:

- Threshold values for assessing muscle mass, muscle strength and physical performance are variable.
- Care should be taken to determine the appropriate cut-off values in the population in which they are being applied.
- Most data regarding muscle strength and performance comes from older populations.
- The applicability of diagnostic criteria in different ethnicities is uncertain.

Diagnostic Criteria

Malnutrition

- Global Leadership initiative on Malnutrition (GLIM)

The Global Leadership Initiative on Malnutrition (GLIM) produced a consensus statement in 2019 outlining the recommended assessment domains for a diagnosis of malnutrition.

Table 2: GLIM diagnostic criteria for malnutrition

| | <i>Etiologic</i> | <i>Phenotypic</i> |
|--|-------------------------------------|---------------------|
| <i>GLIM criteria: Presence of at least one phenotypic criteria and one etiologic criteria</i> | Reduced food intake or assimilation | Weight loss |
| | Inflammation | Low body mass index |
| | | Reduced muscle mass |

Cederholm T, Jensen GL, Correia MITD, et al. GLIM Core Leadership Committee; GLIM Working Group. GLIM criteria for the diagnosis of malnutrition - A consensus report from the global clinical nutrition community. Clin Nutr. 2019 Feb;38(1):1-9. doi: 10.1016/j.clnu.2018.08.002. Epub 2018 Sep 3. ([Pub Med](#))

Sarcopenia

There is no global consensus of the diagnostic criteria for sarcopenia. Commonly used definitions are included below:

- *European Working Group on Sarcopenia in Older People (EWGSOP1)*

Table 3: EWGSOP1 diagnostic criteria for sarcopenia

| <i>Low muscle strength</i> | <i>Low muscle mass</i> | <i>Poor muscle function</i> |
|--|---|--|
| Grip strength <30 kg men <20 kg women | ALM/height (m)² <7.26 kg/m ² men <5.50 kg/m ² women | Gait Speed (4m walk test) ≤0.8 m/sec |

Cruz-Jentoft AJ, Baeyens JP, Bauer JM, Boirie Y, Cederholm T, Landi F, Martin FC, Michel JP, Rolland Y, Schneider SM, Topinková E, Vandewoude M, Zamboni M. Sarcopenia: European consensus on definition and diagnosis: Report of the European Working Group on Sarcopenia in Older People. *Age Ageing*. 2010 Jul;39(4):412-23. doi: 10.1093/ageing/afq034. Epub 2010 Apr 13. ([Pub Med](#))

- *European Working Group on Sarcopenia in Older People updated definition (EWGSOP2)*

Table 4: FNIH diagnostic criteria for sarcopenia

| <i>Low muscle strength</i> | <i>Low muscle mass</i> | <i>Poor muscle function</i> |
|--|--|-----------------------------|
| Grip strength <26 kg men <16 kg women | ALM/BMI <0.789 kg/BMI men <0.512 kg/BMI women | N/A |

Cruz-Jentoft AJ, Bahat G, Bauer J, Boirie Y, Bruyère O, Cederholm T, Cooper C, Landi F, Rolland Y, Sayer AA, Schneider SM, Sieber CC, Topinkova E, Vandewoude M, Visser M, Zamboni M. Sarcopenia: revised European consensus on definition and diagnosis. *Age Ageing*. 2019 Jan 1;48(1):16-31. doi: 10.1093/ageing/afy169. ([Pub Med](#))

- *Foundation for the National Institutes of Health biomarkers consortium sarcopenia project (FNIH)²*

Table 5: EWGSOP2 diagnostic criteria for sarcopenia

| <i>Low muscle strength</i> | <i>Low muscle mass</i> | <i>Poor muscle function</i> |
|---|---|---|
| Grip strength <27 kg men <16 kg women or Chair Stands >15 sec five rises | ALM/height (m)² <7.00 kg/m ² men <5.50 kg/m ² women or ALM <20kg men <15kg women | Gait Speed (4m walk test) ≤0.8 m/sec or SPPB Score ≤8 points or TUG ≥20 sec or 400m walk ≥6 minutes or non-completion (used only to classify severity) |

Studenski SA, Peters KW, Alley DE, Cawthon PM, McLean RR, Harris TB, Ferrucci L, Guralnik JM, Fragala MS, Kenny AM, Kiel DP, Kritchevsky SB, Shardell MD, Dam TT, Vassileva MT. The FNIH sarcopenia project: rationale, study description, conference recommendations, and final estimates. *J Gerontol A Biol Sci Med Sci*. 2014 May;69(5):547-58. doi: 10.1093/gerona/glu010. ([Pub Med](#))

- *Cancer specific CT image analysis*

Table 6: Cancer-specific CT image analysis research diagnostic criteria for sarcopenia

| <i>Low muscle strength</i> | <i>Low muscle mass</i> | <i>Poor muscle function</i> |
|----------------------------|---|-----------------------------|
| N/A | SMI [SMA/height (m)²] at L3 <52.4 cm ² /m ² men <38.5 cm ² /m ² women | N/A |

Prado CM, Lieffers JR, McCargar LJ, Reiman T, Sawyer MB, Martin L, Baracos VE. Prevalence and clinical implications of sarcopenic obesity in patients with solid tumours of the respiratory and gastrointestinal tracts: a population-based study. *Lancet Oncol*. 2008 Jul;9(7):629-35. doi: 10.1016/S1470-2045(08)70153-0. ([Pub Med](#))

Table 7: Cancer-specific CT image analysis research diagnostic criteria for sarcopenia

| <i>Low muscle strength</i> | <i>Low muscle mass</i> | <i>Poor muscle function</i> |
|----------------------------|---|-----------------------------|
| N/A | SMI [SMA/height (m)²] at L3 <43 cm ² /m ² (men with BMI <24.9) <53 cm ² /m ² (men with BMI >25) <41 cm ² /m ² (women of any BMI) | N/A |

Martin L, Birdsell L, Macdonald N, Reiman T, Clandinin MT, McCargar LJ, Murphy R, Ghosh S, Sawyer MB, Baracos VE. Cancer cachexia in the age of obesity: skeletal muscle depletion is a powerful prognostic factor, independent of body mass index. *J Clin Oncol*. 2013 Apr 20;31(12):1539-47. doi: 10.1200/JCO.2012.45.2722. ([Pub Med](#))

How to complete assessment

Malnutrition

The Patient-Generated Subjective Global Assessment (PG-SGA) and Subjective Global Assessment (SGA) are validated assessment tools that align with GLIM criteria for diagnosing malnutrition and can be used to assess and diagnose malnutrition in people with cancer.

- *Patient-Generated Subjective Global Assessment (PG-SGA)*

Ottery FD. Definition of standardized nutritional assessment and interventional pathways in oncology. Nutrition. 1996 Jan;12(1 Suppl):S15-9. doi: 10.1016/0899-9007(96)90011-8. ([Pub Med](#))

Patient-Generated Subjective Global Assessment (PG-SGA) 'how to' guide

The PG-SGA is a 4 in 1 tool that can be used for nutrition screening, assessment, triaging and monitoring.


Materials required:

- PG-SGA worksheet

Procedure:

The PG-SGA consists of 2 main components. The patient generated component, (also known as the PG-SGA short form) and then worksheets 1 to 5.

The patient generated component - Consists of boxes 1-4 and can be completed by the patient prior to dietitian assessment.



Scored Patient-Generated Subjective Global Assessment (PG-SGA)

History: Boxes 1 - 4 are designed to be completed by the patient.
[Boxes 1-4 are referred to as the PG-SGA Short Form (SF)]

Patient Identification Information

1. Weight (See Worksheet 1)

In summary of my current and recent weight:

I currently weigh about ____ kg
I am about ____ cm tall

One month ago I weighed about ____ kg
Six months ago I weighed about ____ kg

During the past two weeks my weight has:

decreased (1) not changed (0) increased (0)

Box 1

2. Food intake: As compared to my normal intake, I would rate my food intake during the past month as

unchanged (0)
 more than usual (0)
 less than usual (1)

I am now taking

normal food but less than normal amount (1)
 little solid food (2)
 only liquids (3)
 only nutritional supplements (3)
 very little of anything (4)
 only tube feedings or only nutrition by vein (0) **Box 2**

3. Symptoms: I have had the following problems that have kept me from eating enough during the past two weeks (check all that apply)

no problems eating (0)

no appetite, just did not feel like eating (3) vomiting (3)

nausea (1) diarrhea (3)

constipation (1) dry mouth (1)

mouth sores (2) smells bother me (1)

things taste funny or have no taste (1) feel full quickly (1)

problems swallowing (2) fatigue (1)

pain; where? (3) _____

other (1)** _____

Examples: depression, money, or dental problems **Box 3

4. Activities and Function:

Over the past month, I would generally rate my activity as:

normal with no limitations (0)
 not my normal self, but able to be up and about with fairly normal activities (1)
 not feeling up to most things, but in bed or chair less than half the day (2)
 able to do little activity and spend most of the day in bed or chair (3)
 pretty much bed ridden, rarely out of bed (3)

Box 4

The remainder of this form is to be completed by your doctor, nurse, dietitian, or therapist. Thank you.

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Additive Score of Boxes 1-4 **A**

Box 1 - Assesses chronic, intermediate or acute weight change.

Complete for both 1 and 6 months. Use 6 month history *only* if 1 month not available. Refer to worksheet 1 for weight loss scoring.

The maximum score is 5 points for this box. Up to 4 points for weight loss and up to one point for the past 2 weeks

Box 2 - Assesses changes in the amount, type and consistency of food intake during the past 2 month.

Score how the patient self-rates his/her intake.

Note: The score is not additive for this box. Use the highest score checked i.e. max score = 4.

Box 3 - Assesses symptoms that have negatively influenced food intake/absorption or utilisation of nutrients during the past 2 weeks.

Note: Only score symptoms impacting on nutritional intake. Add all points for box 3 total score.

Box 4 - Assesses the patients' activities and function over the past month and is based on the Eastern Cooperative Oncology Group (ECOG) performance status

1. Weight (See Worksheet 1)

In summary of my current and recent weight:

I currently weigh about _____ pounds
I am about _____ feet _____ inches tall

One month ago I weighed about _____ pounds
Six months ago I weighed about _____ pounds

During the past two weeks my weight has:

decreased (1) not changed (0) increased (0)

Box 1 max score = 5 points: up to 4 pts from wt loss + up to 1 point for past 2 wks

Box 1

While height is not essential for scoring, the app calculates BMI

Complete both 1 & 6 months; for scoring, use 1 mo if available. Use 6 months only if 1 month is not available

2. Food intake: As compared to my normal intake, I would rate my food intake during the past month as

- unchanged (0)
- more than usual (0)
- less than usual (1)

I am now taking

- normal food but less than normal amount (1)
- little solid food (2)
- only liquids (3)
- only nutritional supplements (3)
- very little of anything (4)
- only tube feedings or only nutrition by vein (0)

Score how the patient self-rates his/her intake during the past month; this helps to address recent deficit / current risk

Box 2 not additive; max = 4; use the highest score checked, no matter how many options checked; not additive

Box 2

3. Symptoms: I have had the following problems that have kept me from eating enough during the past two weeks (check all that apply)

- no problems eating (0)
- no appetite, just did not feel like eating (3)
- nausea (1)
- constipation (1)
- mouth sores (2)
- things taste funny or have no taste (1)
- problems swallowing (2)
- pain; where? (3) _____
- other (1)** _____
- vomiting (3)
- diarrhea (3)
- dry mouth (1)
- smells bother me (1)
- feel full quickly (1)
- fatigue (1)

**Examples: depression, money, or dental problems

Box 3

4. Activities and Function:

Over the past month, I would generally rate my activity as:

- normal with no limitations (0)
- not my normal self, but able to be up and about with fairly normal activities (1)
- not feeling up to most things, but in bed or chair less than half the day (2)
- able to do little activity and spend most of the day in bed or chair (3)
- pretty much bed ridden, rarely out of bed (3)

Box 4

Worksheet 1 – provides guidance on scoring weight loss

Use 1 month data if available.

Use points to score weight change and add one extra point if patient has lost weight during the past 2 weeks.

Worksheet 1 – Scoring Weight Loss

To determine score, use 1-month weight data if available. Use 6-month data only if there is no 1-month weight data. Use points below to score weight change and add one extra point if patient has lost weight during the past 2 weeks. Enter total point score in Box 1 of PG-SGA.

| Weight loss in 1 month | Points | Weight loss in 6 months |
|------------------------|--------|-------------------------|
| 10% or greater | 4 | 20% or greater |
| 5-9.9% | 3 | 10- 19.9% |
| 3-4.9% | 2 | 6- 9.9% |
| 2-2.9% | 1 | 2- 5.9% |
| 0-1.9% | 0 | 0- 1.9% |

Numerical score from Worksheet 1

Worksheet 2 – identifies conditions that may increase nutritional risk or requirements

Add one point for each of these conditions identified

5. Worksheet 2 – Disease and its relation to nutritional requirements:

Score is derived by adding 1 point for each of the following conditions:

- Cancer
- Presence of decubitus, open wound or fistula
- AIDS
- Presence of trauma
- Pulmonary or cardiac cachexia
- Age greater than 65
- Chronic renal insufficiency

Other relevant diagnoses (specify) _____

Primary disease staging (circle if known or appropriate) I II III IV Other _____

Numerical score from Worksheet 2

Worksheet 3 – Assesses metabolic demand considering fever (how high and for how long) and corticosteroid use

6. Worksheet 3 – Metabolic Demand

Score for metabolic stress is determined by a number of variables known to increase protein & caloric needs. **Note:** Score fever intensity or duration, whichever is greater. The score is additive so that a patient who has a fever of 38.8 °C (3 points) for < 72 hrs (1 point) and who is on 10 mg of prednisone chronically (2 points) would have an additive score for this section of 5 points.

| Stress | none (0) | low (1) | moderate (2) | high (3) |
|------------------------|--------------------|--|--|---|
| Fever | no fever | > 37.2 and < 38.3 | ≥ 38.3 and < 38.8 | ≥ 38.8 °C |
| Fever duration | no fever | < 72 hours | 72 hours | > 72 hours |
| Corticosteroids | no corticosteroids | low dose (< 10 mg prednisone equivalents/day) | moderate dose (≥ 10 and < 30 mg prednisone equivalents/day) | high dose (≥ 30 mg prednisone equivalents/day) |

Numerical score from Worksheet 3

Worksheet 4 – captures the results of a nutrition focused physical exam.

7. Worksheet 4 – Physical Exam

Exam includes a subjective evaluation of 3 aspects of body composition: fat, muscle, & fluid. Since this is subjective, each aspect of the exam is rated for degree. Muscle deficit/loss impacts point score more than fat deficit/loss. Definition of categories: 0 = no abnormality, 1+ = mild, 2+ = moderate, 3+ = severe. Rating in these categories is *not* additive but are used to clinically assess the degree of deficit (or presence of excess fluid).

Muscle Status

| | | | | |
|---|----------|-----------|-----------|-----------|
| temples (temporalis muscle) | 0 | 1+ | 2+ | 3+ |
| clavicles (pectoralis & deltoids) | 0 | 1+ | 2+ | 3+ |
| shoulders (deltoids) | 0 | 1+ | 2+ | 3+ |
| intersosseous muscles | 0 | 1+ | 2+ | 3+ |
| scapula (latissimus dorsi, trapezius, deltoids) | 0 | 1+ | 2+ | 3+ |
| thigh (quadriceps) | 0 | 1+ | 2+ | 3+ |
| calf (gastrocnemius) | 0 | 1+ | 2+ | 3+ |
| Global muscle status rating | 0 | 1+ | 2+ | 3+ |

Fat Stores

| | | | | |
|----------------------------------|----------|-----------|-----------|-----------|
| orbital fat pads | 0 | 1+ | 2+ | 3+ |
| triceps skin fold | 0 | 1+ | 2+ | 3+ |
| fat overlying lower ribs | 0 | 1+ | 2+ | 3+ |
| Global fat deficit rating | 0 | 1+ | 2+ | 3+ |

Fluid status

| | | | | |
|-----------------------------------|----------|-----------|-----------|-----------|
| ankle edema | 0 | 1+ | 2+ | 3+ |
| sacral edema | 0 | 1+ | 2+ | 3+ |
| ascites | 0 | 1+ | 2+ | 3+ |
| Global fluid status rating | 0 | 1+ | 2+ | 3+ |

Point score for the physical exam is determined by the overall subjective rating of the total body deficit. No deficit score = 0 points
Mild deficit score = 1 point
Moderate deficit score = 2 points
Severe deficit score = 3 points
Again, muscle deficit/loss takes precedence over fat loss or fluid excess.

Numerical Score for Worksheet 4

Total PG-SGA Score (Total numerical score of A+B+C+D)

Global PG-SGA Category Rating (Stage A, Stage B or Stage C)

Clinician Signature _____ RD RN PA MD DO Other _____ Date _____

Scoring of physical exam:

A score of 0-3 points for each site is given.

No deficit = 0 points

Mild deficit = 1 point

Moderate deficit = 2 points

Severe deficit = 3 points

Point score for the physical exam is determined by the overall subjective rating of the total body deficit. No deficit score = 0 points
Mild deficit score = 1 point
Moderate deficit score = 2 points
Severe deficit score = 3 points
Again, muscle deficit/loss takes precedence over fat loss or fluid excess.

Determine global rating for muscle, fat and fluid stores based on majority rating response.

Determine overall rating and record in Box D

Note: You do not have to complete assessment at all sites to have a global sense for loss or deficit of muscle or fat. Remember the maximum point score for the physical exam is only 3 points – and you are not likely to be off by more than 1 point.

Scoring:

TOTAL PG-SGA SCORE = A + B + C + D

Worksheet 5 - Global rating of nutritional status

A = well nourished,

B = moderate or suspected malnutrition

C = severely malnourished.

You may find it easiest to circle A, B or C for each category as you work down the list. The global status will be determined by the column with the most circles.

Total PG-SGA Score

The PG-SGA provides a score, which is a continuous measure (from 0-16) with the higher the score, the higher the malnutrition risk.

The score can be used to triage nutrition intervention.

Total PG-SGA Score (Total numerical score of A+B+C+D)

Global PG-SGA Category Rating (Stage A, Stage B or Stage C)

| Worksheet 5 – PG-SGA Global Assessment Categories | | | |
|--|--|--|--|
| Category | Stage A | Stage B | Stage C |
| Weight | Well-nourished No weight loss OR recent non-fluid wt gain | Moderate/suspected malnutrition ≤ 5% loss in 1 month (≤10% in 6 months) OR Progressive weight loss | Severely malnourished > 5% loss in 1 month (>10% in 6 months) OR Progressive weight loss |
| Nutrient intake | No deficit OR Significant recent improvement | Definite decrease in intake | Severe deficit in intake |
| Nutrition Impact Symptoms (NIS) | None OR significant recent improvement allowing adequate intake | Presence of NIS (Box 3 of PG-SGA) | Presence of NIS (Box 3 of PG-SGA) |
| Functioning | No deficit OR Significant recent improvement | Moderate functional deficit OR Recent deterioration | Severe functional deficit OR Recent significant deterioration |
| Physical Exam | No deficit OR chronic deficit but with recent clinical improvement | Evidence of mild to moderate loss of muscle mass &/or muscle tone on palpation &/or loss of SQ fat | Obvious signs of malnutrition (e.g., severe loss muscle, fat, possible edema) |

Nutritional Triage Recommendations: Additive score is used to define specific nutritional interventions including patient & family education, symptom management including pharmacologic intervention, and appropriate nutrient intervention (food, nutritional supplements, enteral, or parenteral triage).

First line nutrition intervention includes optimal symptom management.

Triage based on PG-SGA point score

- 0-1 No intervention required at this time. Re-assessment on routine and regular basis during treatment.
- 2-3 Patient & family education by dietitian, nurse, or other clinician with pharmacologic intervention as indicated by symptom survey (Box 3) and lab values as appropriate.
- 4-8 Requires intervention by dietitian, in conjunction with nurse or physician as indicated by symptoms (Box 3).
- ≥ 9 Indicates a critical need for improved symptom management and/or nutrient intervention options.

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Frequently asked questions:

Q: Should we score all symptoms present, or only those impacting nutritional intake?

A: Only score those that affect nutritional intake.

Q: If a symptom was affecting intake within the past 2 weeks but has resolved on the day of assessment, should it still be scored?

A: Yes

Q: Do we score for reduced activity levels even if this is not due to nutrition status (e.g. trauma)?

A: Yes, one week of complete bed rest can be associated with up to 4% loss in lean body mass.

Q: Should I use loss of weight over 1 month or 6 months?

A: Use 1 month if available, this gives a more recent idea of metabolic status (anabolic or catabolic)

Q: If a patient is receiving 100% nutrition requirements via enteral/parenteral nutrition but still has nutrition impact symptoms, do we still score them?

A: Yes. This box helps to determine what symptoms are stopping the patient meeting requirements orally and what nutrition interventions are required.

Key references:

- Ottery FD. Patient-Generated Subjective Global Assessment In: The Clinical Guide to Oncology Nutrition ed. PD McCallum & CG Polisea, 2000; pp 11–23 Chicago: The American Dietetic Association
- Bauer J, Capra S, Ferguson M. Use of the scored Patient-Generated Subjective Global Assessment (PG-SGA) as a nutrition assessment tool in patients with cancer. Eur J Clin Nutr. 2002 Aug;56(8):779-85. doi: 10.1038/sj.ejcn.1601412. PMID: 12122555.
- Also available on the patient global platform in 20 different languages. Each language has undergone translation and cross-cultural adaptation. <https://pt-global.org/pt-global/>

- *Subjective Global Assessment (SGA)*

Detsky AS, McLaughlin JR, Baker JP, Johnston N, Whittaker S, Mendelson RA, Jeejeebhoy KN. What is subjective global assessment of nutritional status? JPEN J Parenter Enteral Nutr. 1987 Jan-Feb;11(1):8-13. doi: 10.1177/014860718701100108. ([Pub Med](#))

SGA instructional video

[SGA Malnutrition Assessment training videos | Queensland Health](#)
www.health.qld.gov.au/nutrition/clinicians/sga-videos

Muscle Mass

- *PG-SGA physical exam*

The PG-SGA physical exam can be used to assess muscle mass. Please refer to the PG-SGA how to guide and the SGA instructional video for details on how to complete.

- *Calf-circumference*

Calf circumference instructional video

[Calf circumference instructional video \(youtube.com\)](#)
<https://youtu.be/XNnRH4T0wM8>

Calf Circumference 'how to' guide

Calf circumference can be used as a marker of muscle mass in clinical practice

Materials required:

- Flexible tape measure (or piece of string and ruler if you do not have access to a tape measure)

Procedure:

- Have the participant seated with knees at 90° angle and feet flat to the floor OR standing with feet flat on the ground.
- Legs apart and relaxed.
- Calf exposed.

How to measure:

- Place tape measure/string around the calf and move up and down without compressing subcutaneous tissue to locate the maximum circumference.
- Take the measure to the nearest 1 mm. If using a string and ruler, measure the length of the string along the ruler to get the measurement.
- Complete 3 measurements on each side. The largest measurement is used for the assessment.

Example Cut Points:

At risk of sarcopenia/malnutrition:

| | |
|--------|--------|
| Female | ≤33 cm |
| Male | ≤34 cm |

Adjustments for BMI:

| BMI | Adjustment |
|----------------------------|------------|
| 18.5-24.9kg/m ² | 0 cm |
| 25-29kg/m ² | -3 cm |
| 30-39kg/m ² | -7 cm |
| >39kg/m ² | -12 cm |

Note: BMI-adjustment should not be applied to individuals with a BMI <18.5kg/m² who are suspected to have weight or muscle losses, as low muscle mass could be hidden if the adjustment factor is applied.

Frequently asked questions:

Q: Should calf circumference be measured sitting or standing?

A: Calf circumference can be measured either sitting or standing.

Q: Should the participant take their shoes off?

A: Flat soled shoes can remain on.

Key references:

- Centers for Disease Control and Prevention. National Center for Health Statistics (NCHS). National Health and Nutrition Examination Survey questionnaire (or examination protocol, or laboratory protocol). 2006. Available from: <https://wwwn.cdc.gov/nchs/data/nhanes/1999-2000/manuals/bm.pdf>
- Gonzalez, M. C., Mehrnezhad, A., Razaviarab, N., Barbosa-Silva, T. G., & Heymsfield, S. B. (2021). Calf circumference: cutoff values from the NHANES 1999–2006. *The American Journal of Clinical Nutrition*, 113(6), 1679-1687

- Prado CM, Landi F, Chew STH, Atherton PJ, Molinger J, Ruck T, Gonzalez MC. Advances in muscle health and nutrition: A toolkit for healthcare professionals. Clin Nutr. 2022 Oct;41(10):2244-2263.

▪ *Bioelectric impedance analysis (BIA)*

BIA instructional videos

[Bioelectrical Impedance Analysis \(youtube.com\)](https://www.youtube.com/watch?v=v-vtytwqbii)
www.youtube.com/watch?v=v-vtytwqbii

[Bioelectrical Impedance Analysis \(youtube.com\)](https://www.youtube.com/watch?v=vcus3qclsu)
www.youtube.com/watch?v=vcus3qclsu

Bioelectrical Impedance Analysis (BIA) 'how to' guide

Materials required:

- Bioelectrical impedance analysis scale or device (+ electrodes)
- Alcohol swabs
- Exam table

Procedure:

- Ask participant to remove all jewelry/watch
- For accurate measurements, participants should refrain from moving or talking during the measurement

Foot-to-foot

- Measure height and weight
- Enter participants characteristics into the scale
- Participant should stand on the scale with hands and feet on the corresponding electrode pads ensuring that arms should not be in contact with the torso

Hand-to-foot

- Measure height
- Participant should lie on exam table with legs straight and arms by side but no body parts touching
- Prepare skin to receive electrodes by cleaning it with an alcohol swab
- Place electrodes on wrist, hand, ankle and foot (on same side of body) and connect clips to electrodes
- Take resistance measurement (in ohms) and plug into appropriate equation.

Example Cut Points:

| | Males | Females |
|--|-----------------------|------------------------|
| Appendicular skeletal muscle index (ASMI)* for BIA | <7 kg/m ² | <5.7 kg/m ² |
| Fat-free mass index (FFMI) | <17 kg/m ² | < 15 kg/m ² |
| Appendicular lean mass adjusted for BMI* (ALM/BMI) | < 0.725 | < 0.591 |

*These cut points are examples of currently published cut points; however, it is important to consider the cut point most appropriate for the population you are assessing.

DRAFT

Frequently asked questions:

Q: Do I need to ask participants to empty their bladder prior to taking the measurement?

A: No. The amount of fluid held in the bladder is relatively small and will have an insignificant effect on the measurement output.

Q: Should I take repeat measurements at the same time of day as previous measurements?

A: Yes, it is good practice where feasible to take repeated measurements at a similar time of day, particularly if you want to compare measurements over time.

Key references:

- Sheean P et al., American Society for Parenteral and Enteral Nutrition Clinical Guidelines: The Validity of Body Composition Assessment in Clinical Populations. Journal of Parenteral and Enteral Nutrition 2020; 44(1): 12 – 43.
- Price K, Earthman C. Update on body composition tools in clinical settings: computed tomography, ultrasound, and bioimpedance applications for assessment and monitoring. European Journal of Clinical Nutrition 2019; 73: 187 – 193.
- Cederholm T, et al. GLIM criteria for the diagnosis of malnutrition - A consensus report from the global clinical nutrition community. Clin Nutr. 2019 Feb;38(1):1-9.

- *Bioelectric spectroscopy analysis (BIS)*

BIS instructional video can be accessed via the below link

[What is BIS? - SOZO® Digital Health Platform \(youtube.com\)](https://www.youtube.com/watch?v=bppbood1spg)

www.youtube.com/watch?v=bppbood1spg

Bioelectrical Impedance Spectroscopy (BIS) 'how to' guide

Materials required:

- Bioelectrical impedance spectroscopy scale or device (+ electrodes)
- Disinfectant wipes to clean the electrode pads between use

Procedure:

- Ask participant to remove all jewelry/watch.
- Participants should stand on the scale with hands and feet on the corresponding electrode pads ensuring that arms should not be in contact with the torso.
- For accurate measurements, participants should refrain from moving or talking during the measurement.

Example Cut Points:

| | Males | Females |
|--|-----------------------|------------------------|
| Appendicular skeletal muscle index (ASMI)* for BIA | <7 kg/m ² | <5.7 kg/m ² |
| Fat-free mass index (FFMI) | <17 kg/m ² | < 15 kg/m ² |
| Appendicular lean mass adjusted for BMI* (ALM/BMI) | < 0.725 | < 0.591 |

*Assumes BIS device provides output on appendicular skeletal muscle or appendicular lean mass.

These cut points are examples of currently published cut points; however it is important to consider the cut point most appropriate for the population you are assessing.

Frequently asked questions:

Q: Do I need to ask participants to empty their bladder prior to taking the measurement?

A: No. The amount of fluid held in the bladder is relatively small and will have an insignificant effect on the measurement output.

Q: Should I take repeat measurements at the same time of day as previous measurements?

A: Yes, it is good practice where feasible to take repeated measurements at a similar time of day, particularly if you want to compare measurements over time.

Key references:

- Sheean P et al., American Society for Parenteral and Enteral Nutrition Clinical Guidelines: The Validity of Body Composition Assessment in Clinical Populations. *Journal of Parenteral and Enteral Nutrition* 2020; 44(1): 12 – 43.
- Price K, Earthman C. Update on body composition tools in clinical settings: computed tomography, ultrasound, and bioimpedance applications for assessment and monitoring. *European Journal of Clinical Nutrition* 2019; 73: 187 – 193.
- Cederholm T, et al. GLIM criteria for the diagnosis of malnutrition - A consensus report from the global clinical nutrition community. *Clin Nutr.* 2019 Feb;38(1):1-9.

Muscle Strength

- *Handgrip strength*

Hand grip strength instructional videos

[Handgrip strength - YouTube](https://www.youtube.com/watch?v=82zseimmne0)

www.youtube.com/watch?v=82zseimmne0

[Jamar Hand Dynamometer Demo \(youtube.com\)](https://www.youtube.com/watch?v=9-e0dcxia5m)

www.youtube.com/watch?v=9-e0dcxia5m

Hand Grip Strength 'how to' guide

Hand grip strength is used as a measure of muscle strength.

Materials required:

- Hand Grip Dynamometer
- Chair with back rest

Procedure:

- Patient position: subject seated, shoulders adducted and neutrally rotated, elbow flexed at 90°, forearm in neutral and wrist between 0 and 30° of dorsiflexion. The arm is not supported by examiner or armrest and the dynamometer is presented vertically and in line with the forearm.

Instruction to participant:

“I want you to hold the handle like this and squeeze as hard as you can.” The examiner demonstrates and then gives the dynamometer to the subject. “Are you ready? Squeeze as hard as you can.” As the subject begins to squeeze, the examiner says, “Harder!... Harder!... Relax”

How to measure:

- It is recommended that the test is repeated a total of six times, three on each side.
- A rest of 60 seconds is recommended between each trial to prevent fatigue.
- The maximum measurement on each side is recorded. Read grip strength in kilograms and record the result to the nearest 1 kg.
- Also record hand dominance, i.e. right, left or ambidextrous

Example Cut Points:

At risk if max score:

| | |
|--------|-------|
| Female | <16kg |
| Male | <27kg |

* Select the most appropriate cut point for the population you are working with

Frequently asked questions:

Q: Which hand grip dynamometer should I use?

A: There is a wide range of hand grip dynamometers. The Jamar hand dynamometer (Lafayette Instrument Company, USA) is the most widely cited in the literature and accepted as the gold standard by which other dynamometers are evaluated. It is recommended if comparing pre and post intervention measures that the same instrument is used to improve accuracy.

Q: How long should the patient grip for?

A: It is suggested that 3 seconds is a sufficient period of time for a patient to exert maximal strength during a hand grip strength assessment.

Key references:

1. Roberts HC, Denison HJ, Martin HJ, Patel HP, Syddall H, Cooper C, Sayer AA. A review of the measurement of grip strength in clinical and epidemiological studies: towards a standardised approach. *Age Ageing*. 2011 Jul;40(4):423-9.
2. Dodds RM, Syddall HE, Cooper R et al. Grip strength across the life course: normative data from twelve British studies. *PLoS One* 2014; 9: e113637.
3. Massy-Westropp, N.M., et al., *Hand Grip Strength: age and gender stratified normative data in a population-based study*. BMC research notes, 2011. **4**(1): p. 1-5.
4. Núñez-Cortés, R., et al., *Handgrip strength measurement protocols for all-cause and cause-specific mortality outcomes in more than 3 million participants: A systematic review and meta-regression analysis*. Clinical Nutrition, 2022.

- *Chair stand test (5 times sit to stand)*

| |
|--|
| Chair stand test (5 times sit to stand) instructional video |
| Five Time Sit to Stand Test (FTSST) (youtube.com) www.youtube.com/watch?v=_jpl-iurj5a |

| | | |
|--|--------------------------|--------------------------|
| Chair Stand Test (5-times-sit-to-stand) 'how to' guide | | |
| Materials required: <ul style="list-style-type: none"> ▪ Stopwatch ▪ Chair with backrest | | |
| Procedure: <ul style="list-style-type: none"> ▪ Patient position: Sitting in the middle of the chair with their back straight and feet flat on the floor and hip width apart. Patients should have their hands placed on opposite shoulders crossed at the wrists. ▪ The patient should be offered one practise trial before measurements are recorded. If the clinician is worried about patient fatigue, they should demonstrate one stand and then encourage two repetitions. <p><u>Instruction to participant:</u></p> <ul style="list-style-type: none"> ▪ "I want you to stand up and sit down 5 times as quickly as you can when I say 'Go'." <p><u>How to measure:</u></p> <ul style="list-style-type: none"> ▪ Record the total time from saying "go" to when the patients bottom hits the chair after the 5th stand. ▪ Patient use of upper limb or need for assistance indicates test failure. This should be recorded along with the type of support required. | | |
| Example Cut Point: <table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">Low strength</td> <td style="width: 50%;">> 15 seconds for 5 rises</td> </tr> </table> <p>* Select the most appropriate cut point for the population you are working with</p> | Low strength | > 15 seconds for 5 rises |
| Low strength | > 15 seconds for 5 rises | |
| Frequently asked questions: <p>Q: What is the recommended chair height: A: Recommended chair height varies in the literature, most commonly between 43 – 45cm.</p> <p>Q: Can this test be done remotely via telehealth? A: A safety and feasibility study published in 2023 demonstrated that for people with an AKPS ≥ 60 'Able to care for most needs; but requires occasional assistance' can safely do the 30 second sit to stand test. This can be extrapolated to the 5 times sit to stand.</p> <p>Q: What is the minimum clinically important difference (MCID)? A: Research in an oncology population is not currently available, however, in a population of people undergoing vestibular rehab the MCID was reported to be 2.3 seconds.</p> | | |
| Key references: <ol style="list-style-type: none"> 1. Mehmet, H., A.W.H. Yang, and S.R. Robinson, <i>What is the optimal chair stand test protocol for older adults? A systematic review.</i> Disabil Rehabil, 2020. 42(20): p. 2828-2835. | | |

2. Cesari M, Kritchevsky SB, Newman AB et al. Added value of physical performance measures in predicting adverse health-related events: results from the Health, Aging and Body Composition Study. *J Am Geriatr Soc* 2009; 57: 251–9.
3. Klukowska, A.M., et al., *Five-repetition sit-to-stand test performance in healthy individuals: reference values and predictors from 2 prospective cohorts*. *Neurospine*, 2021. **18**(4): p. 760.
4. Bohannon, R.W., *Reference values for the five-repetition sit-to-stand test: a descriptive meta-analysis of data from elders*. *Perceptual and motor skills*, 2006. **103**(1): p. 215-222.
5. Buatois, S., et al., *Five times sit to stand test is a predictor of recurrent falls in healthy community-living subjects aged 65 and older*. *Journal of the American Geriatrics Society*, 2008. **56**(8): p. 1575-1577.

Muscle Performance

- *Short Physical Performance Battery (SPPB)*

SPPB instructional videos

[Short Physical Performance Battery \(SPPB\) \(youtube.com\)](https://www.youtube.com/watch?v=n_rjoghqqz4&t=520s)
www.youtube.com/watch?v=n_rjoghqqz4&t=520s

[EWDSOP2 Clinical Algorithm - Severity Chair Stand Test | ANHI](#)

[EWDSOP2 Clinical Algorithm - Severity Gait Speed Test | ANHI](#)

[EWDSOP2 Clinical Algorithm - Severity Balance Test | ANHI](#)

Short Physical Performance Battery (SPPB) 'how to' guide

The SPPB is an objective measure of balance, lower extremity strength and functional capacity in older adults

Materials required:

- Stopwatch
- Chair with backrest
- Tape measure

Procedure:

The Short Physical Performance Battery consists of 3 tests, (Balance, Gait speed, Chair stand) and all tests should be performed in the same order as presented in this protocol.

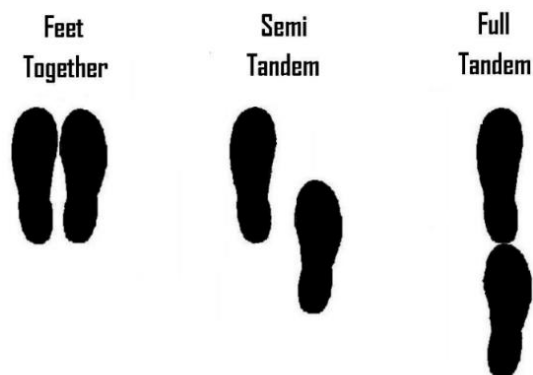
Balance test

- The participant must be able to stand unassisted without the use of a cane or walker. You may help the participant to get up.

Instruction to participant:

“Let’s begin the evaluation. I would like you to stand in different positions to test your balance. If you cannot do a particular stance, or if you feel it would be unsafe to try to do it, tell me and we’ll move on to the next one. Please don’t do anything you feel unsafe in attempting.”

The balance tests stances are shown in the figure below:



Source: https://www.physio-pedia.com/Short_Physical_Performance_Battery#/media/File:Screenshot_2022-11-30_at_09.31.30.png

A. Side by side Stand

(Demonstrate) “I want you to try to stand with your feet together, side-by-side, for about 10 seconds”
You may use your arms or bend your knees but try not to move your feet. Please hold the position until we tell you to stop.

Stand next to the participant to help him/her into the side-by-side position.

Supply just enough support to the participant’s arm to prevent loss of balance.

When the participant has his/her feet together, ask “**Are you ready?**”

Then let go and begin timing as you say, “**Ready, begin.**”

Stop the stopwatch and say “**Stop**” after 10 seconds or when the participant steps out of position or grabs your arm.

B. Semi-Tandem Stand

(Demonstrate) Now I want you to try to stand with the side of the heel of one foot touching the big toe of the other foot for about 10 seconds. You may put either foot in front, whichever is more comfortable for you.

Repeat instructions above.

C. Tandem Stand

(Demonstrate) “Now I want you to try to stand with the heel of one foot in front of and touching the toes of the other foot for about 10 seconds. You may put either foot in front, whichever is more comfortable for you.

Repeat instructions above.

Gait Speed test

- Mark a 4m course on a flat surface.

Instructions to participant:

“Now I am going to observe how you normally walk. If you use a cane or other walking aid and you feel you need it to walk a short distance, then you may use it.”

A. First Gait Speed test

“This is our walking course. I want you to walk to the other end of the course at your usual speed, just as if you were walking down the street to go to the store.”

Demonstrate

“Walk all the way past the other end of the tape before you stop. I will walk with you. Do you feel this would be safe?”

Have the participant stand with both feet touching the starting line.

When I want you to start, I will say: “Ready, begin.” When the participant acknowledges this instruction say: “Ready, begin.”

Press the start/stop button to start the stopwatch as the participant begins walking. Walk behind and to the side of the participant.

Stop timing when one of the participant’s lead foot is completely across the end line.

B. Second Gait Speed test

“Now I want you to repeat the walk. Remember to walk at your usual pace and go all the way past the other end of the course.”

Repeat instructions above.

Chair Stand test

- Patient position: Sitting in the middle of the chair (against wall) with back straight and feet flat on the floor and hip width apart. Patients should have their hands placed on opposite shoulders crossed at the wrists.
- Prior to test completion the clinician should demonstrate the sit to stand procedure.

Instruction to participant:

“Do you think it would be safe for you to try to stand up from a chair without using your arms?”

If yes then explain and demonstrate procedure

First, fold your arms across your chest and sit so that your feet are on the floor; then stand up keeping your arms folded across your chest.

“When I say 1, 2, 3, GO begin standing up and sitting down again as quickly as you can. I will count each full sit to stand out loud and you should complete 5 as quickly as you can. Are you ready to start?” Once the patient says yes, start the test by saying “1, 2, 3, GO”.

Stop the stopwatch when participant has straightened up completely for the fifth time

How to measure:

- The clinician times 5 completed sit to stands
- If the patient has to use their arms to stand stop the test.
- Incorrectly executed stands i.e., not standing fully, are not counted

Scoring:**Scoring for each balance test:**

| Side-Side | Points | Semi-Tandem | Points | Tandem | Points |
|---------------------|----------|---------------------|----------|------------------------|----------|
| Held for 10 sec | 1 point | Held for 10 sec | 1 point | Held for 10 sec | 2 points |
| Not held for 10 sec | 0 points | Not held for 10 sec | 0 points | Held for 3 to 9.99 sec | 1 point |
| Not attempted | 0 points | Not attempted | 0 points | Held for < than 3 sec | 0 points |
| | | | | Not attempted | 0 points |

Balance test scores

Side by side Test Score _____

Semi-tandem Test Score _____

Tandem Test Score _____

Total _____

Scoring Gait speed test:

1. Time for 4 meters. _____ sec (measure to two decimal places)
2. If participant did not attempt test or failed, circle why in table below. Otherwise allocate a score using the table below

| | |
|---|---|
| Tried but unable to complete | 1 |
| Participant could not walk unassisted | 2 |
| Not attempted, you felt unsafe | 3 |
| Not attempted, participant felt unsafe | 4 |
| Participant unable to understand instructions | 5 |
| Other (Specify) | 6 |
| Participant refused | 7 |
| Aids for walk (None, Cane other) | |

Scoring

| Completion time (4m) | Points |
|----------------------|--------|
| >8.70 sec | 1 |
| 6.21-8.70 sec | 2 |
| 4.82-6.20 sec | 3 |
| <4.82 sec | 4 |
| ≥60 sec | 0 |

Comments _____

Scoring for chair stand test:

| | |
|--|----------|
| Participant unable to complete 5 chair stands or completes stands in >60 sec | 0 points |
| If chair stand time is 16.70 sec or more | 1 point |
| If chair stand time is 13.70 to 16.69 sec | 2 points |
| If chair stand time is 11.20 to 13.69 sec | 3 points |
| If chair stand time is 11.19 sec or less | 4 points |

Scoring for Complete Short Physical Performance Battery Test scores

Total Balance Test Score _____
Gait Speed Test Score _____
Chair Stand Test Score _____
Total _____

Classification of limitations based on SPPB score:

| Score | Classification |
|-------|----------------------|
| 0-3 | Severe limitations |
| 4-6 | Moderate limitations |
| 7-9 | Mild limitations |
| 10-12 | Minimal limitations |

Example Cut Point:

| | |
|--------------------------|-----------|
| low physical performance | ≤8 points |
|--------------------------|-----------|

* Select the most appropriate cut point for the population you are working with

Key references:

1. Cruz-Jentoft AJ, Bauer, J, Bahat, G, et al., Writing Group for the European Working Group on Sarcopenia in Older People 2 (EWGSOP2), and the Extended Group for EWGSOP2, Sarcopenia: revised European consensus on definition and diagnosis, *Age and Ageing*. 2018, 48:16–31, <https://doi.org/10.1093/ageing/afz046>
2. Guralnik JM, Ferrucci L, Simonsick EM, Salive ME, Wallace RB. Lower-extremity function in persons over the age of 70 years as a predictor of subsequent disability. *N Engl J Med*. 1995 2;332(9):556-61. doi: 10.1056/NEJM199503023320902.
3. Pavasini R., Guralnik J., Brown J.C., di Bari M., Cesari M., Landi F., Vaes B., Legrand D., Verghese J., Wang C., et al. Short physical performance battery and all-cause mortality: Systematic review and meta-analysis. *BMC Med*. 2016;14:215. doi: 10.1186/s12916-016-0763-7
4. Short physical performance battery (SPPB) guide [Internet]. sppbguide.com. Available from: <https://sppbguide.com/smart-phone-app>

▪ *Timed Up & Go*

TUG instructional videos

[The Timed Up and Go \(TUG\) Test \(youtube.com\)](https://www.youtube.com/watch?v=tnay64mab78)
www.youtube.com/watch?v=tnay64mab78

[The timed up and go test - YouTube](https://www.youtube.com/watch?v=lakvr517vos)
www.youtube.com/watch?v=lakvr517vos

Timed Up and Go (TUG) 'how to' guide

To assess mobility, balance, walking ability and fall risk in adults 65+

Materials required:

- Measure and mark a 3-metre walkway either with tape or traffic cone
- Standard height chair (seat height 44-47cm, arm height 67cm) at the beginning of the walkway
- Stopwatch
- Pen and paper to record activity

Procedure:

- Regular footwear and usual assistive walking aids should be used if normally used.
- To begin the test the patient should sit on the chair, feet flat on the floor, one foot slightly in front of the other and hands on the arm rest of the chair.
- When the patient is ready, say "Go"
- The patient should stand up, walk to a line (or traffic cone) that is 3 meters away, turn around at the line, walk back to the chair, and sit down.
- The participant should be instructed to use a comfortable and safe walking speed.

Instructions to participant:

"When you are ready, stand up, walk to the line on the floor at your normal pace, turn around, walk back and sit down."

How to measure:

- A stopwatch should be used to time the test (in seconds).
- The stopwatch should start when you say go. and should be stopped with the patient's buttocks touch the seat.

Example Cut Point:

| | |
|-----------------|-------------|
| Low performance | ≥20 seconds |
|-----------------|-------------|

* Select the most appropriate cut point for the population you are working with

Frequently asked questions:

Q: Should a practice run be completed first.

A: Yes, the patient should be able to do one practice that is not timed

Q: Can walking assistive devices be used

A: Yes, if there is a requirement to use an assistive device the upper extremities should not be on this device but on the chair arms (if used for walking), but it should be nearby.

Q: Should the patient be instructed to walk as fast as they can

A: No, it should be a normal comfortable and safe walking speed

Key references:

1. Ishii S, Tanaka T, Shibasaki K et al. Development of a simple screening test for sarcopenia in older adults. *Geriatr Gerontol Int* 2014; 14(Suppl 1): 93–101.
2. Gulistan Bahat a, Asli Tufan a, Fatih Tufan a, Cihan Kilic a, Timur Selçuk Akpınar b, Murat Kose b, Nilgun Erten b, Mehmet Akif Karan a, Alfonso J. Cruz-Jentoft c Bischoff 2003 (127)
3. Podsiadlo, D. and Richardson, S. (1991). "The timed "Up & Go": a test of basic functional mobility for frail elderly persons." *J Am Geriatr Soc* 39(2): 142-148.
4. Timed Up and Go test for predicting sarcopenia Martinez BP et al. *CLINICS* 2015;70(5):369-372

- *Gait Speed Test (4m walk test)*

Gait Speed instructional video

[NIH Toolbox 4 Meter Walk Gait Speed Test \(youtube.com\)](https://www.youtube.com/watch?v=iz3aqytxnb8)
www.youtube.com/watch?v=iz3aqytxnb8

Gait Speed Test (4m Walk Test) 'how to' guide

The gait speed test assesses an individual's functional mobility. Gait speed has been used as a predictor of decline in functional mobility.

Materials required:

- 2 traffic cones, placed 4m apart
- Measuring tape
- Tape to mark start line
- Stopwatch

Procedure:

- A distance of 4 meters is measured over a level surface, with 2 meters for acceleration and 2 meters for deceleration.
- Patient starts from standing wearing outdoor shoes.
- They should walk at their comfortable speed over the entire distance.

Instructions to participant:

“This activity involves walking from one place to another. I want you to walk to the other end of the course at your usual speed, as if you were walking down the street to go to the shops. 3,2,1 Go”.

How to measure:

- The patient should be timed once the first foot passes the start line; the time is stopped once the first foot crosses the finish line.
- Two trials are given, with the average comfortable speed calculated.
- Gait speed is measured by the distance/time to walk that distance (e.g., 4m/___sec)

Example Cut Point:

| | |
|----------------|----------------|
| Low gait speed | <0.8m / second |
|----------------|----------------|

* Select the most appropriate cut point for the population you are working with

Frequently asked questions:

Q: What is a comfortable walking speed?
 A: The participants normal or natural walking speed.

Key references:

- Cruz-Jentoft AJ, Bahat G, Bauer J, et al. Writing Group for the European Working Group on Sarcopenia in Older People 2 (EWGSOP2), and the Extended Group for EWGSOP2. Sarcopenia: revised European consensus on definition and diagnosis. Age Ageing. 2019 Jan 1;48(1):16-31. doi: 10.1093/ageing/afy169. Erratum in: Age Ageing. 2019 Jul 1;48(4):601.

- Montero-Odasso, M., Schapira, M., Soriano, E. R., Varela, M., Kaplan, R., Camera, L. A., Mayorga, L. M. (2005). Gait velocity as a single predictor of adverse events in healthy seniors aged 75 years and older. *Journal of Gerontology: Biological Sciences*, 60, 1304-1309.
- Bohannon, R. W. (2008). Population representative gait speed and its determinants. *Journal of Geriatric Physical Therapy*, 31, 49-52.

▪ 400m Walk Test

400m Walk Test instructional video

400m walk test instructional video ([youtube.com](https://youtu.be/OGfW6_ahi_8))
https://youtu.be/OGfW6_ahi_8

400m Walk Test 'how to' guide

The 400m walk test can be used to classify the severity of sarcopenia in the context of physical function and mobility.

Materials required:

- 2 traffic cones, placed 18.5m apart
- Tape to mark start line
- Stopwatch
- Tape measure
- (Optional) A chair may be placed at the starting/finishing area as patient may wish to rest after the test

Procedure:

- Set-up test environment: set-up 2 cones in a straight line, 18.5m apart (assuming a 1.5m turning circle making it a 40m circuit up and back).
- Position patient: Patients begin the test at the start line from a standing position. They should walk down the corridor, turn around the cone in a continuous loop, passing the course twice in each lap.
- Explain the test, including safety instructions (included below)
- Collect pre and post-test outcomes measures (heart rate and BORG dyspnoea scale at a minimum)

Instruction to participant:

Prior to the test

“This is not a fitness test. Please walk at a speed as if you were taking a stroll in the park, knowing that you have a longer distance to cover. This circuit, around both cones is 40 meters, we would like you to repeat the course 10 times to complete a 400m distance walk at a steady pace, without overexertion.

I will stand at the side of the circuit, when I say go, start walking at a comfortable pace you can maintain.

You are permitted to stop, and to have a standing rest for up to 60 seconds at a time as necessary, but please resume walking as soon as you are able. If you experience new or increasing chest pain, feel light-headed, a bit confused, unbalanced, become very short of breath or have very sore or very tired legs please stop walking and let me know right away.

I will now measure your heart rate. I will also ask you to rate the difficulty of your breathing. Its starts at number 0 where your breathing is causing no difficulty at all and progressed through to number 10 where your breathing difficulty is maximal. (Collect Outcomes).

Are you ready to start? When I say 1, 2, 3, GO begin walking. 1, 2, 3, GO (start timer).

During Test

After each lap, the clinician should announce the number of laps completed and the number remaining. For example, you are doing well, you have completed 4 laps and have 6 to go.

How to measure:

- Record total time and individual lap time. If applicable the number, timing, and reasons for rest stops (fatigue, chest pain, feeling faint or dizzy, shortness of breath, or other) should be recorded. In the case of noncompletion, gait speed should be obtained from the distance and time walked until drop-out.

Example Cut Point:

| | |
|--------------------------|-------------------------------|
| low physical performance | ≥ 6 minutes or non-completion |
|--------------------------|-------------------------------|

* Select the most appropriate cut point for the population you are working with

- If test completion takes greater than 15 minutes stop the test at 15 minutes and record as non-completion.
- A 400MWT of greater than 6 minutes is equivalent to a walking speed of 1.1 meters per second or slower and indicates low physical performance. A non-completion also indicates low physical performance.

Frequently asked questions:

Q: Should the patient use their assistive walking device?

A: Whilst the authors of this tip sheet were unaware of any definitive advice regarding the use of walking aids we would recommend that patients use their normal walking device during test completion to ensure patient safety throughout.

Key references:

- Newman AB, et al. Association of long-distance corridor walk performance with mortality, cardiovascular disease, mobility limitation, and disability. JAMA 2006; 295: 2018–26.
- Rolland YM, Cesari M, Miller ME, Penninx BW, Atkinson HH, Pahor M. Reliability of the 400-m usual-pace walk test as an assessment of mobility limitation in older adults. J Am Geriatr Soc. 2004 Jun;52(6):972-6.
- Lindemann U, Krumpoch S, Becker C, Sieber CC, Freiberger E. The course of gait speed during a 400m walk test of mobility limitations in community-dwelling older adults. Z Gerontol Geriatr. 2021 Dec;54(8):768-774.

Exemplars of evidence-based care in practice

The following case studies have been developed as exemplars of evidence-based care in practice. It is hoped they will help to support the implementation of the position statement recommendations into practice.

Assessment of skeletal muscle mass via CT

| <i>The Nutritional Biomarker in the oesophagogastric cancer care pathway</i> | |
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| WHAT did the initiative involve? | <p><i>Using CT body composition assessment to measure skeletal muscle mass as part of malnutrition diagnosis for patients undergoing surgical resection of oesophageal and gastric cancer.</i></p> <p><i>This formed the basis for a nutrition care pathway that focused on the assessment and monitoring of nutrition status throughout treatment. Body composition assessment using CT occurred at diagnosis and restaging, with monitoring using calf circumference and hand grip strength, during chemoradiation and after surgery.</i></p> |
| WHO was involved in the initiative? | <i>Dietitian (project lead), surgeon (clinical lead) and nursing involvement in project planning & implementation.</i> |
| WHERE did the initiative occur? | <i>Alfred Health Outpatient setting – oesophagogastric surgery clinic, including MDM.</i> |
| WHO was the target of the initiative? | <i>Adult patients (≥18 years) diagnosed with oesophagogastric cancer undertaking a curative multimodal treatment pathway with surgical resection.</i> |
| WHEN was the initiative performed? | <i>At diagnosis and throughout treatment.</i> |
| HOW was the initiative undertaken? | <i>This project was funded by the Southern Melbourne Integrated Cancer Service Funding Program Quality Improvement Project grant. This included 0.4 EFT for a dietitian to lead the project.</i> |
| OUTCOMES | <p><i>The NuBio care pathway was developed. 90% of patients had nutrition assessment, including muscle measurement (via CT body composition analysis) before multidisciplinary meeting. During the pilot phase (n=8) less weight loss and muscle loss occurred and less patients were diagnosed with malnutrition than usual care.</i></p> <p><i>The pathway has now been implemented into clinical practice.</i></p> |
| REFERENCE | <p><i>Final report:</i> https://www.vics.org.au/_files/ugd/5b0453_be4d939ca1904d21bf17897df8daf446.pdf</p> |

Nutrition care pathway for upper GI cancer surgery

| Implementation of a perioperative nutrition care pathway in Upper GI cancer surgery | |
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| WHAT did the initiative involve? | <p>The aims of this study were to:</p> <ol style="list-style-type: none"> 1) Determine whether implementation of a standardised perioperative nutrition pathway for patients undergoing UGI cancer surgery improves access to dietetics care, 2) To evaluate study feasibility, fidelity, resource requirements and effect on clinical outcomes. <p>The pathway included guidelines for the timing, frequency and type of dietetics intervention patients should receive based on PG-SGA score, for the following stages: diagnosis/planning, neoadjuvant therapy (if applicable), pre-surgery and surgery.</p> |
| WHO was involved in the initiative? | Nutrition, surgical and oncology clinicians. |
| WHERE did the initiative occur? | Outpatient setting (surgical) Four major metropolitan hospitals in Melbourne |
| WHO was the target of the initiative? | Adult patients (>18 years) with newly diagnosed UGI cancer planned for curative intent surgery |
| WHEN was the initiative performed? | September 2018 - August 2019 |
| HOW was the initiative undertaken? | Prospective pilot study (n = 35), with historical controls (n = 35) as standard care. |
| OUTCOMES | <p>Implementation of this standardised nutrition pathway resulted in improved access to dietetics care. The percentage of participants receiving preoperative dietetic intervention increased from 55% to 100% ($p < 0.001$). Mean \pm SD dietetics contacts increased from 2.2 ± 3.7 to 5.9 ± 3.9 ($p < 0.001$). Non-statistically significant decreases in preoperative nutrition-related hospital admissions, and surgical complications were demonstrated in patients who underwent neoadjuvant therapy. Recruitment feasibility and high fidelity to the intervention suggest that a larger study would be viable.</p> |
| REFERENCE | <p>Deftereos I, Hitch D, Butzkueven S, Carter V, Arslan J, Fetterplace K, Fox K, Ottaway A, Pierce K, Steer B, Varghese J, Kiss N, Yeung J. Implementation of a standardised perioperative nutrition care pathway in upper gastrointestinal cancer surgery: A multisite pilot study. <i>J Hum Nutr Diet.</i> 2023 Apr;36(2):479-492</p> |

Prehabilitation program for patients undergoing GI cancer surgery

| Prehabilitation program for patients undergoing GI Cancer surgery | |
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| WHAT did the initiative involve? | <p>All patients are assessed by a dietitian and exercise physiologist, as well as having a wellbeing assessment completed.</p> <p>Dietitian assessment includes:</p> <ul style="list-style-type: none"> ▪ Patient-Generated Subjective Global Assessment ▪ SARC-F ▪ BIA to assess muscle mass <p>Physiotherapy / Exercise physiology assessment includes:</p> <ul style="list-style-type: none"> ▪ Hand grip strength and Chair Stand Test to assess muscle strength ▪ Timed Up and Go test and Gait Speed test to assess muscle function <p>After the initial assessment, patients participate in the multimodal program that consists of exercise (1 or 2, 60-minute exercise sessions/week), nutritional education and counselling and psychological support. The GI cancer nurse specialist contacts participants by phone or sees them when they come to the gym twice a week to provide support and encouragement.</p> <p>Patients are followed up 30 days after surgery.</p> |
| WHO was involved in the initiative? | <p>Surgeons (GI) and peri-op team (cancer nurse, anaesthetic, allied health)</p> <ul style="list-style-type: none"> ▪ Referral to PAC – GI surgeons or MDT clinicians ▪ Risk assessment (falls risk, nutrition risk screening) – nursing ▪ Anaesthetic assessment – anaesthetist ▪ Referral to prehab – cancer nurse or care coordinator |
| WHERE did the initiative occur? | <p>Prehabilitation Program Concord Repatriation General Hospital, NSW</p> |
| WHO was the target of the initiative? | <p>Adult patients (>18 years) with gastrointestinal (GI) cancer waiting for elective colorectal and upper GI cancer surgery with a curative intent</p> |
| WHEN was the initiative performed? | <p>Screening and assessment initiated at time of diagnosis at either: - the GI cancer multidisciplinary team meeting - or pre-admission clinic (PAC).</p> |
| HOW was the initiative undertaken? | <p>In 2018, Concord hospital implemented a pilot study for a colorectal preoperative optimisation program (CPOP). Following the success of CPOP, the prehabilitation team extended their work to establish prehabilitation for gastrointestinal cancer surgery (the Prehab-GI program) in January 2020. This program is currently operating under a research framework.</p> |
| OUTCOMES | <p>Formal outcomes will not be made available until after the study concludes. The program intends to report on the following measures:</p> <ul style="list-style-type: none"> ▪ attendance |

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| | <ul style="list-style-type: none"> ▪ <i>compliance</i> ▪ <i>functionality</i> ▪ <i>length of hospital stay</i> ▪ <i>post operative outcomes</i> ▪ <i>psychological status</i> ▪ <i>nutritional status</i> ▪ <i>anxiety</i> ▪ <i>depression</i> <p><i>Anecdotally, the prehabilitation team has noted positive outcomes throughout the program. These outcomes include improved family engagement and a positive change in organisational culture towards the concept of prehabilitation</i></p> |
| REFERENCE | <p><i>Prehabilitation: Key principles for preparing patients for surgery</i> https://aci.health.nsw.gov.au/_data/assets/pdf_file/0005/743360/ACI-Prehabilitation-key-principles-for-preparing-patients-for-surgery.pdf</p> <p><i>Case studies of existing prehabilitation sites in NSW</i> https://aci.health.nsw.gov.au/_data/assets/pdf_file/0006/740598/ACI-Case-studies-of-existing-prehabilitation-sites-in-NSW.pdf</p> |

Advocating with the MDT for a business case to establish a new clinical service

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| Advocating with the MDT for a business case to establish a new clinical service | |
| WHAT did the initiative involve? | <p><i>Development of a business case to advocate for implementing a Nutrition service for Chemotherapy outpatients - Who does it benefit and how?</i></p> <p><i>Key components of business case included:</i></p> <ul style="list-style-type: none"> • <i><u>Gap in service</u> – overview of current Alfred Health outpatient oncology service with analysis of attendance and growth rates; completion of benchmarking with other health services; data on rates of malnutrition using results from malnutrition point prevalence study.</i> • <i><u>Evidence base</u> – outline of current evidence-based guidelines highlighting the importance of nutrition intervention throughout the whole trajectory of a patient’s cancer journey (including pre/during/post treatment). This included: Optimal cancer care pathways (OCPs), ESPEN guideline on nutrition in cancer patients, and The National Institute of Clinical Excellence guidelines for haematological cancers.</i> • <i><u>Consequences and risk involved if no change is made</u> - increased mortality/infections/serious complications, reduced muscle mass and poor physical function, increased length of hospital stay and admissions, increased healthcare costs, and increased treatment-related toxicity, reduced response to treatment and increased relapse rates.</i> |

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| | <ul style="list-style-type: none"> • <i><u>Predicted benefits of new service</u> - reduced incidence of malnutrition/sarcopenia/cancer cachexia; improved recovery from the side-effects of chemotherapy; enhanced recovery post cancer surgery; reduced length of stay and prevention of readmissions due to nutrition failure; improved clinical outcomes, mortality and morbidity; improved patient satisfaction and quality of life.</i> • <i><u>Proposal</u> – outline of proposed changes including what the new allocated nutrition service would include, expected outcomes and recommended actions.</i> • <i><u>Financials</u> – breakdown of staffing (EFT) and other financial requirements</i> |
| WHO was involved in the initiative? | <i>Dietitian led initiative</i> |
| WHERE did the initiative occur? | <i>Outpatient Haematology and Oncology Centre (HOC) Alfred Health, Melbourne</i> |
| WHO was the target of the initiative? | <i>Adult patients (>18 years) with cancer attending the haematology and oncology outpatient centre</i> |
| WHEN was the initiative performed? | <i>April 2019</i> |
| HOW was the initiative undertaken? | <i>Business case presented to Alfred Cancer executives to advocate and request for future funding to establish a new clinical service.</i> |
| OUTCOMES | <p><i>0.6EFT (Grade 3) requested, 0.3EFT (Grade 3) received</i></p> <p><i><u>Next steps:</u></i></p> <ul style="list-style-type: none"> ▪ <i>Design and implement a model of care based on international best practice guidelines and OCPs to provide a collaborative and effective nutrition service to oncology outpatients.</i> ▪ <i>Collect ongoing data to advocate for additional EFT</i> |

How to train clinicians in new assessment measures

| PG-SGA training and skills maintenance program | |
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| WHAT did the initiative involve? | <p><i>Development of a PG-SGA training and skills maintenance program:</i></p> <ul style="list-style-type: none"> • <i><u>Individual level</u> – Development of an online training module and instructional video to instruct and train clinicians in completing the PG-SGA and increase knowledge and confidence about its use in clinical practice.</i> • <i><u>Team/service level</u> – Planning and establishing a mandatory training/competency program and monitoring of staff compliance to the program over time. This includes a frequent (approximately 6-monthly) skills maintenance session with a group of dietitians in order maintain competency in completing the PG-SGA, informal inter-rater reliability testing via peer observation and discussion of practical patient studies in the context of the PG-SGA.</i> |
| WHO was involved in the initiative? | <i>Dietitians from Peter MacCallum Cancer Centre.</i> |
| WHERE did the initiative occur? | <i>Inpatient and outpatient setting Peter MacCallum Cancer Centre</i> |
| WHO was the target of the initiative? | <i>Clinicians working in cancer care</i> |
| WHEN was the initiative performed? | <i>Ongoing</i> |
| HOW was the initiative undertaken? | <i>Local quality improvement and education project</i> |
| OUTCOMES | <ul style="list-style-type: none"> • <i><u>Individual level</u> – information included in the training modules includes who can do it, when to do it (frequency), where/setting that is appropriate, and instructions on how to complete the PG-SGA worksheets and physical exam. This has led to improved knowledge and confidence in using the PG-SGA in clinical practice.</i> • <i><u>Team/service level</u> – Development of a guideline that covers the details i.e., PG-SGA training/competency program must be completed by all dietitians within 2 weeks of starting their job. This includes completing the online learning package and 2 x peer review sessions. PG-SGA skills maintenance sessions to be repeat every 6 months.</i> |

Patient case studies

Oral therapy

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| SITUATION | 64F “Jane Smith” presented with severe back pain found to have thoracic bone lesion consistent with a metastatic disease |
| WHAT care was provided? (Action) | <ul style="list-style-type: none"> • Investigations: <ul style="list-style-type: none"> - <i>Biopsy confirms ER+/PR+/Her2 negative disease consistent with breast cancer.</i> - <i>MRI: thoracic partial cord compression</i> - <i>Staging scans: bone only disease (other spinal lesions but nil at risk of compromise) and breast primary</i> • Treatment <ul style="list-style-type: none"> - <i>Surgical decompression completed: Patient discharged to home as was able to undertake self-care</i> - <i>Completed radiotherapy as an outpatient</i> - <i>First line metastatic breast cancer therapy started as outpatient</i> <ol style="list-style-type: none"> a. <i>Letrozole daily tablet</i> b. <i>Ribociclib (tablet 21 days of 28-day cycle)</i> c. <i>Denosumab 120mg monthly injection delivered by GP</i> • Improvements: <ul style="list-style-type: none"> - <i>Staging improving, cancer markers improving</i> • Side effects: <ul style="list-style-type: none"> - <i>Joint aches</i> - <i>Reduced mobility/reduced strength</i> - <i>Muscle wasting</i> - <i>Weight gain</i> • Identification of sarcopenia <ul style="list-style-type: none"> - <i>Identification sarcopenia by team and subsequent weight gain from hospitalization and reduced mobility and capacity to exercise.</i> • Referred to: <ol style="list-style-type: none"> 1. <i>Outpatient dietitian</i> 2. <i>Exercise physiology for rehabilitation post-surgery, muscle gain</i> |
| WHO delivered the care? (Actor) | Identification of sarcopenia – <i>Nurse specialist</i> Nutrition assessment – <i>Dietitian</i> Assessment of muscle mass – <i>Exercise physiologist</i> |
| WHERE was the care delivered? (Context) | Outpatient setting Private Cancer Centre |
| WHO received care? (Target) | Adult outpatient undergoing oral therapy Family present to support dietary recommendations provide support in transportation |
| WHEN was care provided? | <ul style="list-style-type: none"> • <i>Medical Oncology - reviewed every 3 months in conjunction with scans</i> • <i>Nutrition and physio - over the course of 12 weeks post referrals</i> |

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| (Time) | |
| OUTCOMES | <ul style="list-style-type: none"> • Weight gain and muscle mass stabilized • Functional capacity increased • Participating in regular exercise 2-3 times per week |

Rural patient

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| SITUATION | 45M “John Smith” with oropharyngeal cancer living in rural NSW (8 hours from Sydney) requiring induction chemotherapy followed by 7 weeks of chemo-radiotherapy with prophylactic PEG feeding tube. |
| WHAT care was provided? (Action) | <ul style="list-style-type: none"> • Initial malnutrition screening <ul style="list-style-type: none"> - <i>Malnutrition screening (MST) performed via phone by Head & Neck Cancer Coordinator</i> - <i>Referral to Dietitian for MST score 4 (7-month history of dysphagia and 15% weight loss in 3-6 months).</i> • Initial Nutrition Assessment <ul style="list-style-type: none"> - <i>PG-SGA = 12C</i> - <i>Dietitian assessment conducted face-to-face at Head & Neck MDT</i> - <i>Identified weight loss due to dysphagia secondary to tumour location limiting patient to a liquid diet.</i> - <i>Education was provided on High Protein, High Energy Liquid diet and John to commence oral nutrition supplements to meet nutrition requirements prior to treatment. Suggested John purchase home scales to monitor weight prior to treatment. John provided with supplement supply to take home.</i> - <i>John attended new patient appointment – weighed by nursing staff, automatic dietitian referral conducted due to nature of treatment and expected nutrition impact symptoms.</i> • Repeat malnutrition screening <ul style="list-style-type: none"> - <i>John admitted to hospital for induction chemotherapy where weekly weight and MST were performed by nursing staff.</i> • Nutrition reviews <ul style="list-style-type: none"> - <i>Reviewed by inpatient Dietitian during induction chemo</i> - <i>Weekly dietitian review including weight checks, nutrition assessment, nutrition education and oral/enteral supplement use during chemo-radiotherapy.</i> - <i>Fortnightly Dietitian phone review post treatment (patient returned home to rural NSW), with use of home scales to monitor weight and assist with progression of oral diet and weaning of enteral nutrition.</i> - <i>John attended for follow up 4 weeks and 3 months post treatment. PG-SGA was repeated at 3 months post treatment (score = 7B)</i> • Interventions <ul style="list-style-type: none"> - <i>John educated on High Protein High Energy diet and commenced on oral nutrition supplements during prehab</i> |

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| | <ul style="list-style-type: none"> - <i>Enteral nutrition commenced during week 6 of chemo-radiotherapy due to worsening nutrition impact symptoms (dysphagia, odynophagia, dysgeusia)</i> - <i>Re-commencement of oral diet 4 weeks post treatment – John progressed over a period of 2 months from liquid diet to minced/moist diet and continues on a soft diet due to ongoing xerostomia.</i> - <i>Enteral nutrition was weaned as oral intake increased, with fortnightly Dietitian phone review.</i> |
| WHO delivered the care? (Actor) | <ul style="list-style-type: none"> • <i>Malnutrition screening: Head & Neck Cancer Care Coordinator and inpatient nursing staff</i> • <i>Nutrition assessment and review – H&N dietitian</i> • <i>Symptom management - medical staff, speech pathologist</i> |
| WHERE was the care delivered? (Context) | Inpatient and outpatient setting Specialist Oncology Service in NSW |
| WHO received care? (Target) | Adult patient undergoing treatment for oropharyngeal cancer |
| WHEN was care provided? (Time) | <ul style="list-style-type: none"> • <i>Initial screening – at treatment planning</i> • <i>Initial dietitian assessment – 2 months prior to treatment (prehab)</i> • <i>Rescreening – weekly during inpatient admission and at commencement of chemo-radiation</i> • <i>Nutrition review - during inpatient admission, weekly during chemo-radiation and at regular intervals until 3 months post treatment</i> |
| OUTCOMES | <p>The patient was identified early via phone malnutrition screening and referred to the dietitian for prehabilitation within a timely manner. This initiated weekly screening of weight to monitor for malnutrition. Early Dietitian intervention assisted to prevent further weight loss and improve nutrition status prior to commencing treatment.</p> <p>The early intervention of purchasing home scales to assist with phone reviews improved the accuracy of phone screening and assisted the Dietitian to provide accurate advice regarding nutritional intake to assist in improving malnutrition status.</p> |



Treatment

The treatment chapter of this toolkit will be completed in stage 2 of this project.



Transition of care

The transition of care chapter of this toolkit will be completed in stage 2 of this project.



Tools and tips for implementation

Implementation of the position statement recommendations

The authors of this toolkit suggest a 5-step process to begin implementation of the position statement recommendations:

1. Complete a baseline audit of your organisations' adherence to the position statement recommendations
2. Select the example AACTT framework/s relevant to your clinical context and tailor timeframes to suit local policy and resources. Use of other evidence-based implementation theories, models and frameworks are encouraged to aid your implementation strategy, planning and execution (see details within this section).
3. Tailor the generic pathway to your local context using the AACTT frameworks as a guide (you may create a different version of the pathway for each clinical context in your organisation).
4. Utilise the example clinical indicators to develop local key performance indicators to monitor adherence to your tailored pathway.
5. Use the checklist to identify and address barriers to screening and assessment to support the implementation process within your organisation.

Audit tool

Comparison of clinical practices compared to the COSA cancer-related malnutrition and sarcopenia position statement

Under the 'Recommendation clarified' column the inpatient setting has been used as an example. The Actor, Context, and Target can be tailored to each clinical setting (i.e. day therapy unit / radiotherapy outpatients) at your organisation using the example AACTT frameworks included in the toolkit. Time should be determined with consideration given to best practice and local resourcing.

This audit tool is available as a downloadable Excel document on the COSA website

| Component of care | Recommendation | Recommendation clarified (using the AACTT framework) | Baseline practice |
|-------------------|--|---|--|
| Screening | All people with cancer should be screened for malnutrition in all health settings at diagnosis and repeated as the clinical situation changes, using a screening tool that is valid and reliable in the setting in which it is intended. | <p>Action: screening with a valid, reliable tool for cancer patients to identify patients 'at risk' of malnutrition</p> <p>Actor: screening can be conducted by nursing staff, allied health assistants or other relevant support staff</p> <p>Context: on the ward</p> <p>Target: patients with cancer</p> <p>Time: on admission to hospital (within 24hrs), repeated for those not considered 'at risk' at regular intervals (approx. 1 week)</p> | <input type="checkbox"/> met = ≥80% of the time <input type="checkbox"/> partially met = ≥50-79% of the time <input type="checkbox"/> not met = ≤50% of the time |
| | All people with cancer should be screened for sarcopenia at diagnosis and repeated as the clinical situation changes, using the validated screening tool SARC-F or SARC-F in combination with calf circumference. | <p>Action: screening with a valid, reliable tool for cancer patients to identify patients 'at risk' of sarcopenia</p> <p>Actor: screening can be conducted by nursing staff, allied health assistants or other relevant support staff</p> <p>Context: on the ward</p> <p>Target: patients with cancer admitted to ward X</p> <p>Time: on admission to hospital (within 24hrs), repeated for those not considered 'at risk' at regular intervals (approx. 1 week)</p> | <input type="checkbox"/> met = ≥80% of the time <input type="checkbox"/> partially met = ≥50-79% of the time <input type="checkbox"/> not met = ≤50% of the time |
| Assessment | All people with cancer identified as being 'at risk' of malnutrition following appropriate screening or with a cancer diagnosis or treatment plan known to lead to high risk of malnutrition should have comprehensive nutrition assessment using a tool validated in the oncology population. | <p>Action: all patients considered 'at risk' on screening or with a cancer diagnosis or treatment plan known to lead to high risk should be referred to a dietitian for a comprehensive nutrition assessment using a tool validated in the oncology population.</p> <p>Actor: the staff member who conducts screening should refer to a dietitian. The dietitian should conduct relevant assessments (some may be delegated to the nutrition assistant)</p> <p>Context: on the ward or in some cases, the gym or in outpatients/telehealth following discharge where appropriate</p> <p>Target: patients with cancer admitted to ward X and screened as 'at risk'</p> | <input type="checkbox"/> met = ≥80% of the time <input type="checkbox"/> partially met = ≥50-79% of the time <input type="checkbox"/> not met = ≤50% of the time |

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| | | <p>Time: following referral from the staff member who conducts screening (approx. within 48hrs from referral to assessment) and/or in outpatients following discharge where appropriate</p> | |
| | <p>All people with cancer identified as being 'at risk' of sarcopenia following appropriate screening should have a comprehensive evaluation of muscle status using a combination of assessments for muscle mass, muscle strength and function.</p> | <p>Action: all patients considered 'at risk' on screening should be referred to a dietitian and physiotherapist/exercise physiologist for a comprehensive assessment including evaluation of muscle status (mass, strength, function) using validated outcome measures Actor: the staff member who conducts screening should refer to a dietitian and physiotherapist/exercise physiologist. The dietitian and physiotherapist/exercise physiologist should conduct relevant assessments (some may be delegated to an allied health assistant) Context: on the ward or in some cases, the physio gym or in outpatients/telehealth following discharge where appropriate Target: patients with cancer admitted to ward X and screened as 'at risk' Time: following referral from the staff member who conducts screening (approx. within 48hrs from referral to assessment) and/or in outpatients following discharge where appropriate</p> | <p><input type="checkbox"/> met = ≥80% of the time <input type="checkbox"/> partially met = ≥50-79% of the time <input type="checkbox"/> not met = ≤50% of the time</p> |
| | <p>Interpretation of diagnostic criteria for sarcopenia should be applied recognising that: threshold values for assessing muscle mass, muscle strength and physical performance are variable; care should be taken to determine the appropriate cut-off values in the population in which they are being applied; most data regarding muscle strength and performance comes from older populations; the applicability of diagnostic criteria in different ethnicities is uncertain.</p> | <p>Action: apply appropriate threshold values based on measures chosen Actor: The dietitian and physiotherapist/exercise physiologist should conduct relevant assessments (some may be delegated to the nutrition assistant) Context: on the ward or in some cases the physio gym Target: patients with cancer admitted to ward X and screened as 'at risk' Time: on assessment by dietitian and physiotherapist/exercise physiologist (or alternatively by nutrition assistant) during admission</p> | <p><input type="checkbox"/> met = ≥80% of the time <input type="checkbox"/> partially met = ≥50-79% of the time <input type="checkbox"/> not met = ≤50% of the time</p> |
| <p>Treatment</p> | <p>All people with cancer-related malnutrition and sarcopenia should have access to the core components of treatment including medical nutrition therapy, targeted exercise prescription and physical activity advice, and physical and psychological symptom management.</p> | <p>Action: all patients requiring medical nutrition therapy, targeted exercise prescription or physical and psychological symptom management receive a referral to the appropriate allied health, medical, nursing or other multidisciplinary team member Actor: the staff member who conducts screening, the dietitian, physiotherapy/exercise physiologist or other multidisciplinary team member involved in the patients care Context: ward X Target: patients with cancer admitted to ward X and screened as 'at risk' Time: anytime during admission or following discharge if appropriate</p> | <p><input type="checkbox"/> met = ≥80% of the time <input type="checkbox"/> partially met = ≥50-79% of the time <input type="checkbox"/> not met = ≤50% of the time</p> |

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| | Treatment for cancer-related malnutrition and sarcopenia should be individualised, in collaboration with the multidisciplinary team (MDT), and tailored to meet the needs at each stage of cancer treatment. | <p>Action: all patients requiring nutrition therapy and exercise advice will receive a referral to the dietitian/physiotherapist/ exercise physiologist (or other appropriate allied health, medical, nursing or other multidisciplinary team member); patients to receive individually tailored treatment based on assessments and goals developed collaboratively with the patient</p> <p>Actor: dietitian/physiotherapist/exercise physiologist (or other multidisciplinary team member) involved in the patients care</p> <p>Context: ward X</p> <p>Target: patients with cancer admitted to ward X and screened as 'at risk'</p> <p>Time: anytime during admission or following discharge if appropriate</p> | <input type="checkbox"/> met = ≥80% of the time <input type="checkbox"/> partially met = ≥50-79% of the time <input type="checkbox"/> not met = ≤50% of the time |
| Multidisciplinary Care | Health services should ensure a broad range of health care professionals across the MDT have the skills and confidence to recognise malnutrition and sarcopenia to facilitate timely referrals and treatment. | <p>Action: dietitian/physiotherapist/exercise physiologist (or other appropriate allied health, medical, nursing or other multidisciplinary team member) have appropriate training/skills/confidence (i.e. pass competency/confidence test)</p> <p>Actor: nutrition assistant, dietitian/physiotherapist/exercise physiologist (or other multidisciplinary team member) involved in the patients care</p> <p>Context: ward X</p> <p>Target: patients with cancer admitted to ward X</p> <p>Time: anytime during admission or following discharge if appropriate</p> | <input type="checkbox"/> met = ≥80% of the time <input type="checkbox"/> partially met = ≥50-79% of the time <input type="checkbox"/> not met = ≤50% of the time |
| | MDTs should work towards an individualised and coordinated approach to treating cancer-related malnutrition and sarcopenia. | <p>Action: utilise an appropriate framework/pathway to specify components of care to enable individualised and coordinated care to patients</p> <p>Actor: the multidisciplinary team</p> <p>Context: ward X</p> <p>Target: patients with cancer admitted to ward X</p> <p>Time: anytime during admission or following discharge if appropriate</p> | <input type="checkbox"/> met = ≥80% of the time <input type="checkbox"/> partially met = ≥50-79% of the time <input type="checkbox"/> not met = ≤50% of the time |

AACTT frameworks

The Action, Actor, Context, Target, Time (AACTT) framework¹ is a behaviour specification framework. It has been used to specify the behaviour of individuals relating to screening, assessment and treatment of malnutrition and sarcopenia in a number of clinical settings. These are examples only and recommended timeframes should be adapted to the target population and the local context in which they are being applied.

Example of inpatient or ward setting

| | Action <i>What care is provided?</i> | Actor <i>Who delivers care?</i> | Context <i>Where is the care delivered?</i> | Target <i>Who receives care?</i> | Time <i>When is care provided?</i> |
|-------------------|---|--|--|--|---|
| SCREENING | Conduct malnutrition screening (and rescreening) i.e. MST, MUST | Nurse, allied health assistant, other health professional | Inpatient ward | Patients with cancer admitted to the ward (and those screened as low risk for malnutrition on admission and still an inpatient at day 7) | Within 24 hours of admission for initial screen* (day 6-8 for rescreen) |
| | Conduct sarcopenia screening (and rescreening) i.e. SARC-F, SARC-F in combination with calf circumference | Nurse, allied health assistant, other health professional | Inpatient ward | Patients with cancer admitted to the ward (and those screened as low risk for sarcopenia on admission and still an inpatient at day 7) | Within 24 hours of admission for initial screen* (day 6-8 for rescreen) |
| | Identify high risk patients for direct referral to dietitian | Dietitian, nurse, allied health assistant, other health professional | Inpatient ward | Patients with cancer admitted to the ward | Within 24 hours of admission* |
| | Refer patients at risk of malnutrition to dietitian | Nurse, allied health assistant, other health professional | Inpatient ward – referral via existing referral process/system | Patients considered at risk of malnutrition after screening | Within 24 hours of screening* |
| | Refer patients at risk of sarcopenia to dietitian and exercise physiologist or physiotherapist | Nurse, allied health assistant, other health professional | Inpatient ward – referral via existing referral process/system | Patients considered at risk of sarcopenia after screening | Within 24 hours of screening* |
| ASSESSMENT | Complete full individualised nutrition assessment | Dietitian | Inpatient ward – patients' room | Patients considered at risk of malnutrition after screening | As per local triage criteria |
| | Complete clinical assessment measures for nutrition assessment and diagnosis of malnutrition/ sarcopenia i.e. PG-SGA, BIA, calf circumference | Dietitian, allied health assistant | Inpatient ward – patients' room | Patients considered at risk of malnutrition after screening and undertaking assessment by dietitian | As per local triage criteria |
| | Complete full individualised sarcopenia assessment | Physiotherapist, exercise physiologist | Inpatient ward – patients' room, ward or gym | Patients considered at risk of sarcopenia after screening | As per local triage criteria |
| | Complete clinical assessment measures for evaluation of muscle mass, strength and function, and | Physiotherapist, exercise physiologist, allied health assistant | Inpatient ward – patients' room, ward or gym | Patients considered at risk of sarcopenia after screening and undertaking assessment by | As per local triage criteria |

| | diagnosis of sarcopenia i.e. HGS, SPPB | | | physiotherapist/ exercise physiologist | |
|------------------|---|--|---|--|--|
| TREATMENT | Prescribe individualised medical nutrition therapy | Dietitian (may be delegated to allied health assistant) | Inpatient ward – patients’ room, ward or gym | Patients considered at risk of malnutrition after screening and/or diagnosed with malnutrition | As per local triage criteria and then as specified by dietitian |
| | Prescribe individualised exercise program | Physiotherapist, exercise physiologist (may be delegated to allied health assistant) | Inpatient ward – patients’ room, ward or gym | Patients considered at risk of sarcopenia after screening and/or diagnosed with sarcopenia | As per local triage criteria and then as specified by physiotherapist or exercise physiologist |
| | Refer to other healthcare professionals where appropriate to optimise patient outcomes i.e. psychologist, speech pathologist, social worker, occupational therapist | Dietitian, physiotherapist, exercise physiologist | Inpatient ward – patients’ room, ward or gym | Patients considered at risk of malnutrition/sarcopenia after screening and/or diagnosed with malnutrition/sarcopenia and under the care of a dietitian or physio | Within 1 day of identifying need* |
| DISCHARGE | Ensure malnutrition/ sarcopenia diagnosis documented in discharge summary | Dietitian, physiotherapist, exercise physiologist | Inpatient ward | Patients diagnosed with malnutrition/ sarcopenia | Prior to discharge |
| | Provide a copy of discharge summary to patient and patients’ general practitioner | Dietitian, physiotherapist, exercise physiologist | Inpatient ward | Patients diagnosed with malnutrition/ sarcopenia | Prior to discharge |
| | Where indicated, deliver outpatient nutrition care and/or refer to external services to ensure transition of care | Dietitian | Clinic room, via telehealth and/or via external provider | Patients considered at risk of malnutrition after screening and/or diagnosed with malnutrition requiring ongoing intervention post discharge | Within 48 hours of discharge from hospital* |
| | Where indicated, deliver outpatient physiotherapy care and/or refer to external services to ensure transition of care | Physiotherapist, exercise physiologist | Clinic room, gym, via telehealth and/or via external provider | Patients considered at risk of sarcopenia after screening and/or diagnosed with sarcopenia requiring ongoing intervention post discharge | Within 48 hours of discharge from hospital* |

Key: MST, Malnutrition Screening Tool; MUST, Malnutrition Universal Screening Tool; PG-SGA, Patient-Generated Subjective Global Assessment; BIA, Bioelectric Impedance Analysis; HGS, Handgrip Strength; SPPB, Short Physical Performance Battery

Day therapy unit setting

| | Action <i>What care is provided?</i> | Actor <i>Who delivers care?</i> | Context <i>Where is the care delivered?</i> | Target <i>Who receives care?</i> | Time <i>When is care provided?</i> |
|-------------------|--|--|--|--|--|
| SCREENING | Conduct malnutrition screening (and rescreening) i.e. MST, MUST | Nurse, allied health assistant, other health professional | Day therapy unit (F2F or via telehealth) | All new patients commencing treatment on the unit | C1D1 and at repeated intervals during treatment* |
| | Conduct sarcopenia screening (and rescreening) i.e. SARC-F, SARC-F in combination with calf circumference | Nurse, allied health assistant, other health professional | Day therapy unit (F2F or via telehealth) | All new patients commencing treatment on the unit | C1D1 and at repeated intervals during treatment* |
| | Identify high risk patients for direct referral to dietitian | Dietitian, nurse, allied health assistant, other health professional | Day therapy unit (F2F or via telehealth) | Patients with cancer admitted to the ward | C1D1 |
| | Refer patients at risk of malnutrition to dietitian | Nurse, allied health assistant, other health professional | Day therapy unit - Referral via existing referral process/system | All new patients commencing treatment on the unit | C1D1 and at each cycle during treatment* |
| | Refer patients at risk of sarcopenia to dietitian and exercise physiologist or physiotherapist | Nurse, allied health assistant, other health professional | Day therapy unit - Referral via existing referral process/system | All new patients commencing treatment on the unit | C1D1 and at each cycle during treatment* |
| ASSESSMENT | Complete full individualised nutrition assessment | Dietitian | Day therapy unit (F2F or via telehealth) | Patients identified at risk of malnutrition after screening | Within 1 week of referral being placed* |
| | Complete clinical assessment measures for nutrition assessment and diagnosis of malnutrition i.e. PG-SGA, calf circumference | Dietitian | Day therapy unit (F2F) | Patients identified at risk of malnutrition after screening and undertaking assessment by dietitian | Baseline measures, within 1 week of referral*; repeated at regular intervals |
| | Complete full individualised sarcopenia assessment | Dietitian, physiotherapist, exercise physiologist | Day therapy unit (F2F or via telehealth) | Patients identified at risk of sarcopenia after screening | Within 1 week of referral being placed* |
| | Complete clinical assessment measures for sarcopenia assessment and diagnosis of sarcopenia i.e. HGS, SPPB | Dietitian, physiotherapist, exercise physiologist | Day therapy unit (F2F) | Patients identified at risk of sarcopenia after screening and undertaking assessment by dietitian, EP or physiotherapist | Baseline measures, within 1 week of referral*; repeated at regular intervals |

| | | | | | |
|------------------|---|--|---|---|---|
| TREATMENT | Prescribe individualised medical nutrition therapy | Dietitian (may be delegated to allied health assistant) | Day therapy unit (F2F or via telehealth) | Patients identified at risk of malnutrition after screening and/or diagnosed with malnutrition | Within 1 week of referral* and then as clinically indicated |
| | Prescribe individualised exercise prescription | Physiotherapist, EP (may be delegated to allied health assistant) | Day therapy unit (F2F or via telehealth) | Patients identified at risk of sarcopenia after screening and/or diagnosed with sarcopenia | Within 1 week of referral* and then as clinically indicated |
| | Refer to other healthcare professionals where appropriate to optimise patient outcomes i.e. occupational therapist, psychologist, social worker, speech pathologist | Dietitian, physiotherapist, exercise physiologist | Day therapy unit (F2F or via telehealth) | Patients identified at risk of malnutrition/sarcopenia after screening and/or diagnosed with malnutrition/sarcopenia and under the care of a dietitian and exercise physiologist or physiotherapist | Within 1 day of identifying need* |
| | Collaborate with the multidisciplinary team to provide individualised and tailored malnutrition and sarcopenia treatment | All health professionals involved with cancer-related malnutrition and/or sarcopenia treatment | Day therapy unit, MDT (F2F or via telehealth) | Patients identified at risk of malnutrition after screening and/or diagnosed with malnutrition requiring ongoing intervention | Follow up at each cycle or as clinically indicated* |
| DISCHARGE | Ensure malnutrition/ sarcopenia diagnosis documented in discharge summary | Dietitian, physiotherapist, exercise physiologist | Day therapy unit | Patients diagnosed with malnutrition/ sarcopenia | Prior to discharge |
| | Provide a copy of discharge summary to patient and patients' general practitioner | Dietitian, physiotherapist, exercise physiologist | Day therapy unit | Patients diagnosed with malnutrition/ sarcopenia | Prior to discharge |
| | Refer to external services as indicated | Dietitian, physiotherapist, exercise physiologist | Via external provider | Patients diagnosed with malnutrition/ sarcopenia requiring ongoing intervention post discharge | Follow up as clinically indicated |

* Physical assessments should ideally be conducted F2F, however this may not be practical and appropriate mode should be decided according to local context/ resources/ type of assessment conducted

Key: MST, Malnutrition Screening Tool; MUST, Malnutrition Universal Screening Tool; F2F, Face to face; C1D1, Cycle 1 Day 1; PG-SGA, Patient-Generated Subjective Global Assessment; BIA, Bioelectric Impedance Analysis; HGS, Handgrip Strength; SPPB, Short Physical Performance Battery; MDT, Multidisciplinary Team

Radiotherapy outpatient setting

| | Action <i>What care is provided?</i> | Actor <i>Who delivers care?</i> | Context <i>Where is the care delivered?</i> | Target <i>Who receives care?</i> | Time <i>When is care provided?</i> |
|-------------------|--|---|--|--|---|
| SCREENING | Conduct malnutrition screening (and rescreening) i.e. MST, MUST | Nurse, allied health assistant, other health professional | Radiotherapy outpatients | All new patients with cancer commencing treatment | Radiotherapy planning or week 1 of treatment* and at repeated intervals during treatment |
| | Conduct sarcopenia screening (and rescreening) i.e. SARC-F, SARC-CalF | Nurse, allied health assistant, other health professional | Radiotherapy outpatients | All new patients with cancer commencing treatment | Radiotherapy planning or week 1 of treatment* and at repeated intervals during treatment |
| | Identify high risk patients for direct referral to dietitian | Dietitian, allied health assistant, other health professional | Radiotherapy outpatients | All new patients with cancer commencing treatment on the unit | Radiotherapy planning or week 1 of treatment* |
| | Refer patients at risk of malnutrition to dietitian | Nurse, allied health assistant, other health professional | Radiotherapy outpatients - referral via existing referral process/stsystem | Patients considered at risk of malnutrition after screening + all high-risk patients commencing treatment | Within 24 hours of screening* |
| | Refer patients at risk of sarcopenia to dietitian and exercise physiologist or physiotherapist | Nurse, allied health assistant, other health professional | Radiotherapy outpatients - referral via existing referral process/stsystem | Patients considered at risk of sarcopenia after screening | Within 24 hours of screening* |
| ASSESSMENT | Complete full individualised nutrition assessment | Dietitian | Radiotherapy outpatients (F2F or via telehealth) | Patients identified at risk of malnutrition after screening | Within 1 week of referral being placed* |
| | Complete clinical assessment measures for nutrition assessment and diagnosis of malnutrition i.e. PG-SGA, calf circumference | Dietitian | Radiotherapy outpatients (F2F#) | Patients identified at risk of malnutrition after screening and undertaking assessment by dietitian | Baseline measures, within 1 week of referral being placed*; repeated at regular intervals |
| | Complete full individualised sarcopenia assessment | Dietitian, physiotherapist, exercise physiologist | Radiotherapy outpatients (F2F or via telehealth) | Patients identified at risk of sarcopenia after screening | Within 1 week of referral being placed* |
| | Complete clinical assessment measures for sarcopenia assessment and diagnosis of sarcopenia i.e. HGS, SPPB | Dietitian, physiotherapist, exercise physiologist | Radiotherapy outpatients (F2F#) | Patients identified at risk of sarcopenia after screening and undertaking assessment by dietitian and exercise physiologist or physiotherapist | Baseline measures, within 1 week of referral being placed*; repeated at regular intervals |

| | | | | | |
|------------------|---|--|--|---|---|
| TREATMENT | Prescribe individualised medical nutrition therapy | Dietitian (may be delegated to allied health assistant) | Radiotherapy outpatients (F2F or via telehealth) | Patients identified at risk of malnutrition after screening and/or diagnosed with malnutrition | Within 1 week of referral and then as clinically indicated* |
| | Prescribe individualised exercise program | Physiotherapist, exercise physiologist (may be delegated to allied health assistant) | Radiotherapy outpatients (F2F or via telehealth) | Patients identified at risk of sarcopenia after screening and/or diagnosed with sarcopenia | Within 1 week of referral and then as clinically indicated* |
| | Refer to other healthcare professionals where appropriate to optimise patient outcomes i.e. occupational therapist, psychologist, social worker, speech pathologist | Dietitian, physiotherapist, exercise physiologist | Radiotherapy outpatients (F2F or via telehealth) | Patients identified at risk of malnutrition/sarcopenia after screening and/or diagnosed with malnutrition/sarcopenia and under the care of a dietitian and exercise physiologist or physiotherapist | Within 1 day of identifying need* |
| | Deliver ongoing outpatient nutrition care as indicated | Dietitian | Radiotherapy outpatients (F2F or via telehealth) | Patients identified at risk of malnutrition after screening and/or diagnosed with malnutrition requiring ongoing intervention | Follow up as clinically indicated High-risk patients*: - Weekly during treatment - 2 weekly for 6/52 post-treatment - As required up to 6 months post-treatment |
| | Deliver ongoing outpatient physiotherapy care as indicated | Physiotherapist, exercise physiologist | Radiotherapy outpatients (F2F or via telehealth) | Patients identified at risk of sarcopenia after screening and/or diagnosed with sarcopenia requiring ongoing intervention | Follow up as clinically indicated |
| DISCHARGE | Ensure malnutrition/ sarcopenia diagnosis documented in discharge summary | Dietitian, physiotherapist, exercise physiologist | Radiotherapy outpatients | Patients diagnosed with malnutrition/ sarcopenia | Prior to discharge |
| | Provide a copy of discharge summary to patient and patients' general practitioner | Dietitian, physiotherapist, exercise physiologist | Radiotherapy outpatients | Patients diagnosed with malnutrition/ sarcopenia | Prior to discharge |
| | Refer to external services as indicated | Dietitian, physiotherapist, exercise physiologist | Via external provider | Patients diagnosed with malnutrition/ sarcopenia | Follow up as clinically indicated |

Physical assessments should ideally be conducted F2F, however this may not be practical and appropriate mode should be decided according to local context/ resources/ type of assessment conducted

Key: MST, Malnutrition Screening Tool; MUST, Malnutrition Universal Screening Tool; RTx, Radiotherapy; F2F, Face to face; PG-SGA, Patient-Generated Subjective Global Assessment; BIA, Bioelectric Impedance Analysis; HGS, Handgrip Strength; SPPB, Short Physical Performance Battery

Rural / community setting

| | Action <i>What care is provided?</i> | Actor <i>Who delivers care?</i> | Context <i>Where is the care delivered?</i> | Target <i>Who receives care?</i> | Time <i>When is care provided?</i> |
|-------------------|--|--|---|---|---|
| SCREENING | Conduct malnutrition screening (and rescreening) i.e. MST, MUST | Nurse, allied health assistant, patient, dietitian or other health professional | Outpatient clinic (F2F or via telehealth) | All patients with cancer | At diagnosis, at commencement or change of treatment, or when clinically indicated before, during and after treatment |
| | Conduct sarcopenia screening (and rescreening) i.e. SARC-F, SARC-CaF | Nurse, allied health assistant, dietitian or other health professional | Outpatient clinic (F2F or via telehealth) | All patients with cancer | At diagnosis, at commencement or change of treatment, or when clinically indicated before, during and after treatment |
| | Identify high risk patients for direct referral to dietitian | Nurse, allied health assistant, dietitian or other health professional | Outpatient clinic (F2F or via telehealth) | All patients with cancer | At diagnosis, at commencement or change of treatment* |
| | Refer patients at risk of malnutrition to dietitian | Nurse, allied health assistant, patient, dietitian, or other health professional | Outpatient clinic – referral via existing referral process/system | Patients considered at risk of malnutrition after screening | As soon as possible after identifying malnutrition risk |
| | Refer patients at risk of sarcopenia to dietitian and physiotherapist | Nurse, allied health assistant, dietitian or other health professional | Outpatient clinic – referral via existing referral process/ Private Practice | Patients considered at risk of sarcopenia after screening | As soon as possible after identifying sarcopenia risk |
| ASSESSMENT | Complete full individualised nutrition assessment | Dietitian, appropriately trained health professional | Outpatient clinic (F2F or via telehealth) | Patients considered at risk of malnutrition after screening | At first consult following identification of malnutrition risk* |
| | Complete clinical assessment measures for dietitian assessment and diagnosis of malnutrition i.e. PG-SGA, calf circumference | Dietitian, allied health assistant, appropriately trained health professional | Outpatient clinic (F2F#) | Patients considered at risk of malnutrition after screening and undertaking assessment by dietitian | At first consult following identification of malnutrition risk* |
| | Complete full individualised sarcopenia assessment | Physiotherapist, exercise physiologist, allied health assistant, appropriately trained health professional | Outpatient clinic (F2F or via telehealth) | Patients considered at risk of sarcopenia after screening | At first consult following identification of sarcopenia risk* |

| | | | | | |
|-----------|---|--|---|--|--|
| | Complete clinical assessment measures for assessment and diagnosis of sarcopenia i.e. HGS, SPPB | Physiotherapist, exercise physiologist, allied health assistant, appropriately trained health professional | Outpatient clinic (F2F ^a) | Patients considered at risk of sarcopenia after screening and undertaking assessment | At first consult following identification of sarcopenia risk* |
| TREATMENT | Prescribe individualised medical nutrition therapy | Dietitian (may be delegated to allied health assistant) | Outpatient clinic (F2F or via telehealth) | Patients considered at risk of malnutrition after screening and/or diagnosed with malnutrition | At first consult following malnutrition diagnosis* (or risk identification), and then as specified by dietitian |
| | Prescribe individualised exercise program | Physiotherapist, exercise physiologist (may be delegated to allied health assistant) | Outpatient clinic (F2F or via telehealth) | Patients considered at risk of sarcopenia after screening and/or diagnosed with sarcopenia | At first consult following sarcopenia diagnosis* (or risk identification), and then as specified by physiotherapist or exercise physiologist |
| | Refer to other healthcare professionals where appropriate to optimise patient outcomes i.e. psychologist, speech pathologist, social worker, occupational therapist | Dietitian, physiotherapist, exercise physiologist, health professional | Outpatient clinic (F2F or via telehealth) | Patients considered at risk of malnutrition/sarcopenia after screening and/or diagnosed with malnutrition/sarcopenia and under the care of a dietitian, physiotherapist or exercise physiologist | Within 1 day of identifying need* |
| | Collaborate with the multidisciplinary team to provide individualised and tailored malnutrition and sarcopenia treatment | All health professionals involved with cancer-related malnutrition and/or sarcopenia treatment, general practitioner | Outpatient clinic, MDT meetings, correspondence, established communication pathways | All patients receiving treatment for malnutrition and/or sarcopenia | Throughout treatment |
| DISCHARGE | Ensure malnutrition/ sarcopenia diagnosis documented in discharge summary | Dietitian, physiotherapist, exercise physiologist | Outpatient clinic | Patients diagnosed with malnutrition/ sarcopenia | Prior to discharge |
| | Provide a copy of discharge summary to patient and patients' general practitioner | Dietitian, physiotherapist, exercise physiologist | Outpatient clinic | Patients diagnosed with malnutrition/ sarcopenia | Prior to discharge |
| | Refer to external services as indicated | Dietitian, physiotherapist, exercise physiologist | Via external provider | Patients diagnosed with malnutrition/ sarcopenia | Follow up as clinically indicated |

^a Physical assessments should ideally be conducted F2F, however this may not be practical and appropriate mode should be decided according to local context/ resources/ type of assessment conducted

Key: MST, Malnutrition Screening Tool; MUST, Malnutrition Universal Screening Tool; F2F, Face to face; PG-SGA, Patient-Generated Subjective Global Assessment; BIA, Bioelectric Impedance Analysis; HGS, Handgrip Strength; SPPB, Short Physical Performance Battery; MDT, Multidisciplinary Team

Primary care setting

| | Action <i>What care is provided?</i> | Actor <i>Who delivers care?</i> | Context <i>Where is the care delivered?</i> | Target <i>Who receives care?</i> | Time <i>When is care provided?</i> |
|-------------------|--|--|---|--|--|
| SCREENING | Conduct malnutrition screening (and rescreening) i.e. MST, MUST | General practitioner, general practice nurse | Primary care clinic | Patients attending an appointment with general practitioner, general practice nurse | At time of appointment |
| | Conduct sarcopenia screening (and rescreening) i.e. SARC-F, SARC-F in combination with calf circumference | General practitioner, general practice nurse | Primary care clinic | Patients attending an appointment with general practice nurse | At time of appointment |
| | Identify high risk patients for direct referral to dietitian | General practitioner, general practice nurse | Primary care clinic | Patients attending an appointment with general practice nurse | At time of appointment |
| | Refer patients at risk of malnutrition to dietitian | General practitioner, general practice nurse | Primary care clinic | Patients considered at risk of malnutrition after screening | Within 2 days of screening* |
| | Refer patients at risk of sarcopenia to dietitian and physiotherapist or exercise physiologist | General practitioner, general practice nurse | Primary care clinic | Patients considered at risk of sarcopenia after screening | Within 2 days of screening* |
| ASSESSMENT | Complete full individualised nutrition assessment | Dietitian | Private practice (F2F or via telehealth) | Patients considered at risk of malnutrition | At initial appointment |
| | Complete clinical assessment measures for nutrition assessment and diagnosis of malnutrition/sarcopenia i.e. PG-SGA, BIA, calf circumference | Dietitian | Private practice | Patients considered at risk of malnutrition and undertaking assessment by dietitian | At initial appointment |
| | Complete full individualised sarcopenia assessment | Physiotherapist, exercise physiologist | Private practice (F2F or via telehealth) | Patients considered at risk of sarcopenia | At initial appointment |
| | Complete clinical assessment measures for evaluation of muscle mass, strength and function, and diagnosis of sarcopenia i.e. HGS, SPPB | Physiotherapist, exercise physiologist | Private practice | Patients considered at risk of sarcopenia and undertaking assessment by physiotherapist or exercise physiologist | At initial appointment |

| | | | | | |
|-----------|---|--|--|--|--|
| TREATMENT | Deliver individualised medical nutrition therapy | Dietitian | Private practice (F2F or via telehealth) | Patients considered at risk of malnutrition and/or diagnosed with malnutrition | At initial appointment and then as specified by dietitian |
| | Deliver individualised exercise prescription | Physiotherapist, exercise physiologist | Private practice (F2F or via telehealth) | Patients considered at risk of sarcopenia and/or diagnosed with sarcopenia | At initial appointment and then as specified by physiotherapist or exercise physiologist |
| | Refer to other healthcare professionals where appropriate to optimise patient outcomes i.e. psychologist, speech pathologist, social worker, occupational therapist | Dietitian, physiotherapist, exercise physiologist | Private practice | Patients considered at risk of and/or diagnosed with malnutrition/sarcopenia and under the care of a dietitian or physiotherapist or exercise physiologist | Within 2 days of identifying need* |
| | Collaborate with the multidisciplinary team to provide individualised and tailored malnutrition and sarcopenia treatment | All health professionals involved with cancer-related malnutrition and/or sarcopenia treatment | Private practice (F2F or via telehealth) | Patients considered at risk of and/or diagnosed with malnutrition/sarcopenia and under the care of a dietitian or physiotherapist or exercise physiologist | Follow up as clinically indicated |
| DISCHARGE | Ensure malnutrition/ sarcopenia diagnosis documented in discharge summary | Dietitian, physiotherapist, exercise physiologist | Private practice | Patients diagnosed with malnutrition/ sarcopenia | Prior to discharge |
| | Provide a copy of discharge summary to patient and patients' general practitioner | Dietitian, physiotherapist, exercise physiologist | Private practice | Patients diagnosed with malnutrition/ sarcopenia | Prior to discharge |

* Physical assessments should ideally be conducted F2F, however this may not be practical and appropriate mode should be decided according to local context/ resources/ type of assessment conducted

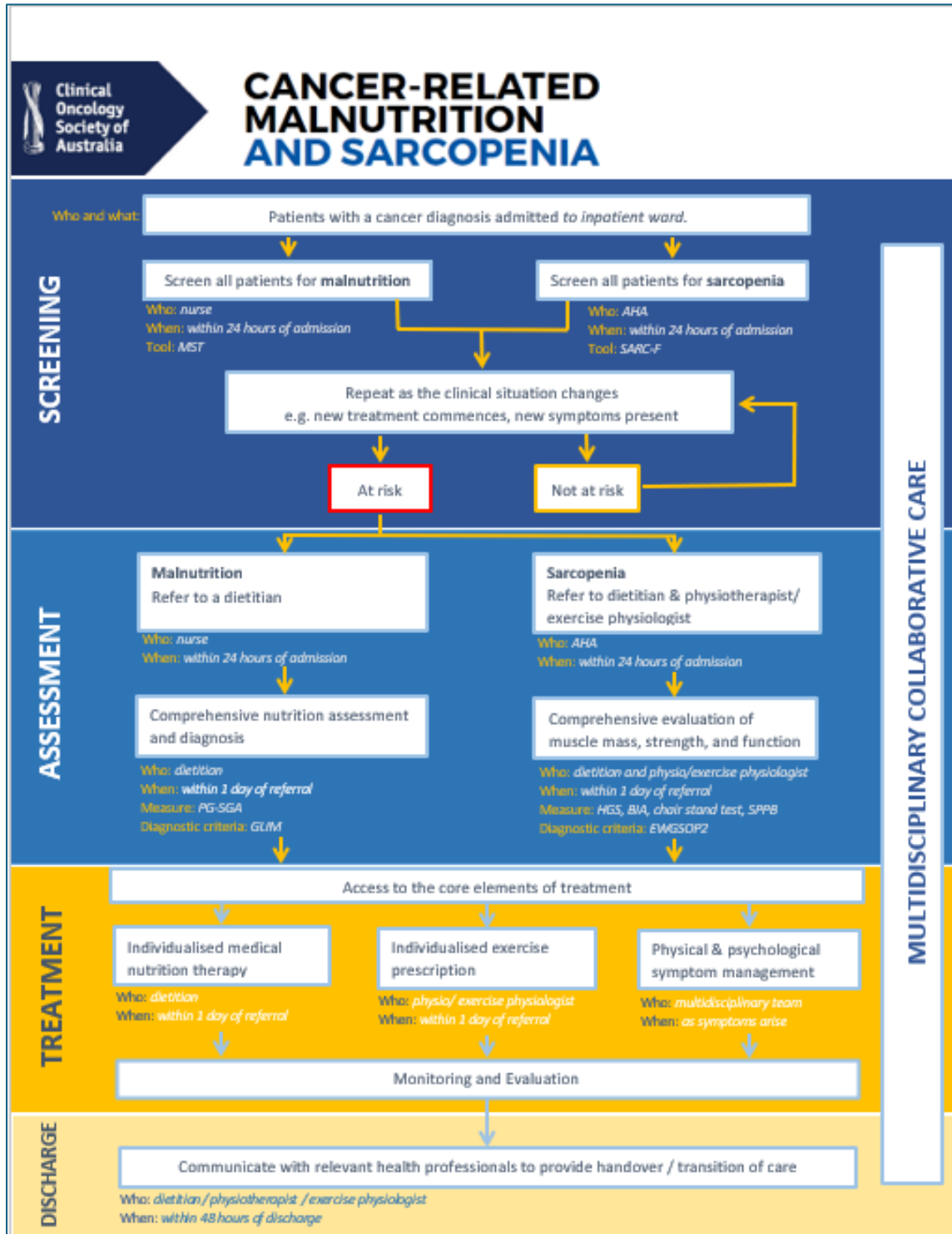
Key: MST, Malnutrition Screening Tool; MUST, Malnutrition Universal Screening Tool; F2F, Face to face; PG-SGA, Patient-Generated Subjective Global Assessment; BIA, Bioelectric Impedance Analysis; HGS, Handgrip Strength; SPPB, Short Physical Performance Battery

Reference:

1. Presseau J, McCleary N, Lorencatto F, Patey AM, Grimshaw JM, Francis JJ. Actor, Action, Context, Target, Time (AACTT): A framework for specifying behaviour. *Implementation Science*, December 2019, 14910:102.

Generic pathway

A generic pathway that can be tailored to each specific context has been developed and is available for download from the toolkit webpage. Use the example AACTT frameworks to tailor the pathway to your local context.



The back page of the generic pathway provides more detail relating to the position statement recommendations.

| | Malnutrition | Sarcopenia |
|------------|---|---|
| SCREENING | <p>Screen all patients with cancer using a validated tool Tools: MST, MUST, MSCT, PG-SGA SF</p> <p>• Identify all patients with a diagnosis or treatment plan known to lead to high nutrition risk:</p> <ul style="list-style-type: none"> • Head and neck, lung, upper or lower GI cancer • Radiation therapy to oral cavity or GI tract • Chemotherapy, immunotherapy or targeted therapies with risk of GI toxicity • Stem cell transplant • Surgery to oral cavity or GI tract <p>AT RISK → refer to dietitian</p> <p>NOT AT RISK → repeat as the clinical situation changes</p> | <p>Screen all patients with cancer using a validated tool Tools: SARC-F, SARC-F in combination with calf circumference</p> <p>AT RISK → refer to dietitian & physiotherapist/exercise physiologist</p> <p>NOT AT RISK → repeat as the clinical situation changes</p> |
| ASSESSMENT | <p>Conduct comprehensive nutrition assessment using assessment tool validated in the oncology population: Measures: PG-SGA SGA</p> <p>Diagnostic criteria:</p> <ul style="list-style-type: none"> • GLIM | <p>Conduct comprehensive evaluation of muscle mass, muscle strength and muscle function. Measures: Muscle mass- CT, BIA, BIS, DXA, MRI, calf circumference Muscle strength- hand grip strength, chair stand test Muscle function- SPPB, gait speed, TUG</p> <p>Diagnostic criteria:</p> <ul style="list-style-type: none"> • EWGSOP 1 • EWGSOP 2 • FNIH • CT image analysis |
| TREATMENT | <p>Dietitian to provide individualised medical nutrition therapy:</p> <ul style="list-style-type: none"> • Dietary counselling on preservation/ ↑ lean muscle • 105-125kj/kg/day • 1.0-1.5 g protein • Relevant education material • Frequency of review based on individual needs | <p>Physio/ exercise physiologist to provide individualised exercise prescription:</p> <ul style="list-style-type: none"> • Targeted resistance +/- aerobic exercise program • Referral to exercise class • Relevant education material • Frequency of review based on individual needs |
| | <p>Monitor clinical and patient-reported outcomes and consider referrals to other healthcare professionals where appropriate to optimise patient outcomes. I.e. psychologist, speech pathologist, social worker, occupational therapist</p> | |
| DISHCHARGE | <p>Communicate with relevant health professionals to provide handover / transition of care</p> <ul style="list-style-type: none"> • Document malnutrition/sarcopenia diagnosis in discharge summary • Provide discharge summary to patient and patients' General Practitioner • Refer to outpatient/community services | |

• Refer to worked AACTT framework examples for more information on adapting the pathway to your local context.

Key: MST, Malnutrition Screening Tool; MUST, Malnutrition Universal Screening Tool; MSCT, Malnutrition Screening Tool for Cancer Patients; PG-SGA SF, Patient-Generated Subjective Global Assessment Short Form; PG-SGA, Patient-Generated Subjective Global Assessment; SGA, Subjective Global Assessment; GLIM, Global Leadership Initiative on Malnutrition; CT, Computed Tomography; BIA, Bioelectric Impedance Analysis; BIS, Bioelectric Spectroscopy Analysis; DXA, Dual energy X-Ray Absorptometry; MRI, Magnetic Resonance Imaging; SPPB, Short Physical Performance Battery; TUG, Timed Up and Go; EWGSOP1, European Working Group on Sarcopenia in Older People; EWGSOP2, European Working Group on Sarcopenia in Older People updated definition; FNIH, Foundation for the National Institutes of Health Biomarkers Consortium Sarcopenia Project;

Example clinical indicators

- Clinical indicators (or key performance indicators) should be used after you have tailored the pathway to your local context, as a way of monitoring compliance to the care pathway.
- The below clinical indicators are examples only and variations can be applied. For example, you may choose to focus on whether the action (such as screening) is completed at all, or measure the timeframe within which it is completed, such as 24, 48 or 72 hours.
- Once you have chosen the clinical indicators relevant to your local context you will need to define how to measure, when to measure, who measures, local compliance targets (i.e. >90%), how to document and how this is communicated with relevant stakeholders in your organisation. For further information regarding how to define each clinical indicator refer to Chapter 2 of the Malnutrition Governance Toolkit ([Malnutrition governance toolkit - Peter MacCallum Cancer Centre](#))
- Timeframes may be dependent on local resources and should be appropriate to the setting and aligned with local policies.

| Component of care | Recommendation | Example clinical indicators |
|-------------------|--|---|
| SCREENING | All people with cancer should be screened for malnutrition in all health settings at diagnosis and repeated as the clinical situation changes, using a screening tool that is valid and reliable in the setting in which it is intended. | Percentage of patients admitted to hospital who received malnutrition screening with a validated screening tool within 24 hours of admission* |
| | | Percentage of patients attending chemotherapy day unit/radiotherapy who received malnutrition screening with a validated screening tool on their initial nursing appointment* |
| | | Percentage of patients admitted to hospital who received repeat malnutrition screening with a validated screening tool within 7 days of admission* |
| | | Percentage of patients attending chemotherapy day unit/radiotherapy who received repeat malnutrition screening with a validated screening tool at interval specified by local policy* |
| | | Percentage of patients identified as “at risk” through malnutrition screening who had a referral placed to the dietitian |
| | All people with cancer should be screened for sarcopenia at diagnosis and repeated as the clinical situation changes, using the validated screening tool SARC-F or SARC-F in combination with calf circumference. | Percentage of patients admitted to hospital who received sarcopenia screening with a validated screening tool within 24 hours of admission* |
| | | Percentage of patients attending chemotherapy day unit/radiotherapy who received sarcopenia screening with a validated screening tool on their initial nursing appointment |
| | | Percentage of patients admitted to hospital who received repeat sarcopenia screening with a validated screening tool within 7 days of admission* |

| | | |
|-------------------|--|---|
| | | Percentage of patients identified as “at risk” through sarcopenia screening who had a referral placed to the dietitian and physiotherapist/exercise physiologist |
| ASSESSMENT | All people with cancer identified as being 'at risk' of malnutrition following appropriate screening or with a cancer diagnosis or treatment plan known to lead to high risk of malnutrition should have comprehensive nutrition assessment using a tool validated in the oncology population. | Percentage of patients identified as being “at risk” of malnutrition based on malnutrition screening who also had a completed nutrition assessment with a tool validated in the oncology population |
| | | Length of time between patients identified as being “at risk” of malnutrition based on malnutrition screening and completion of a nutrition assessment using a tool validated in the oncology population |
| | | Percentage of patients identified as malnourished who have a malnutrition diagnosis documented in their medical history |
| | All people with cancer identified as being 'at risk' of sarcopenia following appropriate screening should have a comprehensive evaluation of muscle status using a combination of assessments for muscle mass, muscle strength and function. | Percentage of patients identified as being “at risk” of sarcopenia, based on sarcopenia screening who also had a comprehensive evaluation of muscle status using a combination of assessments for muscle mass, muscle strength and muscle function. |
| | | Length of time between patients identified as being “at risk” of malnutrition based on malnutrition screening and completion of a comprehensive evaluation of muscle status using a combination of assessments for muscle mass, muscle strength and function. |
| | | Percentage of patients identified as sarcopenic who have a sarcopenia diagnosis documented in their medical history |
| TREATMENT | All people with cancer-related malnutrition and sarcopenia should have access to the core components of treatment including medical nutrition therapy, targeted exercise prescription and physical activity advice, and physical and psychological symptom management. | Percentage of patients with a completed nutrition assessment and a documented malnutrition diagnosis who have a documented malnutrition care plan in place |
| | | Percentage of patients with a documented malnutrition diagnosis who had medical nutrition therapy implemented |
| | | Length of time between admission and implementation of medical nutrition therapy for patients diagnosed with malnutrition |
| | | Percentage of patients with a completed evaluation of muscle mass, strength and function and a documented sarcopenia diagnosis who have a documented exercise prescription in place |
| | | Percentage of patients with a documented sarcopenia diagnosis who had an exercise prescription implemented |
| | | Length of time between admission and implementation of an exercise prescription for patients diagnosed with sarcopenia |

| | | |
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| DISCHARGE | Communicate with relevant health professionals to provide handover / transition of care | Percentage of patients with a malnutrition diagnosis as a result of a nutrition assessment with a with a tool validated in the oncology population who have a malnutrition care plan included as part of their discharge summary |
| | | Percentage of patients with a sarcopenia diagnosis as a result of a comprehensive evaluation of muscle status using a combination of assessment for muscle mass, strength and functional who have a sarcopenia care plan included as part of their discharge summary |

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Checklist to identify and address barriers to screening and assessment

| Barrier | Tips to address barriers |
|--|---|
| Perceived lack of evidence to support practice | <ul style="list-style-type: none"> <input type="checkbox"/> <u>Refer to key evidence-based guidelines:</u> <ul style="list-style-type: none"> - COSA cancer-related malnutrition and sarcopenia position statement¹ - Updated evidence-based practice guidelines for the nutritional management of patients receiving radiation therapy and/or chemotherapy² - Evidence based practice guidelines for the nutritional management of adult patients with head and neck cancer³ - ESPEN guidelines on nutrition in cancer patients⁴ - Oncology evidence-based nutrition practice guidelines. Academy of Nutrition and Dietetics⁵ - Sarcopenia: revised European consensus on definition and diagnosis⁶ - Sarcopenia: A time for action. An SCWD position paper⁷ <input type="checkbox"/> <u>Gather key opinion leaders to support implementation</u> - for example clinical leaders within the multidisciplinary team. |
| Not a priority for health service | <ul style="list-style-type: none"> <input type="checkbox"/> <u>Gain leadership buy-in and engagement</u> - for example clinical leaders within multidisciplinary team and/or hospital executive. <input type="checkbox"/> <u>Identify local barriers and enablers</u> - Identification of barriers and enablers to malnutrition and sarcopenia screening and assessment at individual, team and system levels is the first step to facilitate adherence to evidence-based nutrition care recommendations and policies (refer to implementation section of toolkit for details on how to do this). <input type="checkbox"/> <u>Involve the quality department</u> – develop local key performance indicators and relevant audit schedule. <input type="checkbox"/> <u>Collect local data</u> – The audit tool in the toolkit can be used to show adherence to the COSA position statement recommendations. Use clinical data such as malnutrition or sarcopenia point prevalence survey data to highlight the need. If it's not available, make a plan to collect this data. |
| Low clinician awareness and understanding | <ul style="list-style-type: none"> <input type="checkbox"/> <u>Train relevant clinicians</u> - Utilise freely available training and incorporate into local training packages for clinicians: <ul style="list-style-type: none"> - COSA cancer-related malnutrition and sarcopenia implementation toolkit - Malnutrition and Sarcopenia in Cancer eLearning program on Cancer Institute NSW eviQ website¹³ - Existing videos such as The Importance of Nutrition to Prevent and Treat Low Muscle Mass - YouTube - CanEAT pathway¹⁴ resources available at www.petermac.org/caneatpathway |
| Lack of local policies/ procedures/ pathways | <ul style="list-style-type: none"> <input type="checkbox"/> <u>Map local workflows</u> - Consider incorporating screening for malnutrition and sarcopenia into existing multidisciplinary and/or supportive care screening processes or patient-reported outcomes to aid ease of completion and compliance, reduce the need for additional resources and to support the initiation of appropriate assessment and care. <input type="checkbox"/> <u>Care pathways</u> - Consider use of care pathways to support delivery of optimal patient care (see generic pathway and/or examples given in upper GI/sarcopenia pathway exemplars). <input type="checkbox"/> <u>Local governance</u> - Malnutrition/sarcopenia screening and assessment should be incorporated into the appropriate nutrition care policy directives with local governance, |

| | |
|---|--|
| | <p>management committees and performance review processes embedded to support successful and sustainable implementation.</p> <ul style="list-style-type: none"> <input type="checkbox"/> <u>Malnutrition governance toolkit</u>⁹ - utilise this toolkit to support development of local policies/procedures, key performance indicators and other governance supports. |
| Insufficient pre-existing processes | <ul style="list-style-type: none"> <input type="checkbox"/> <u>Build your team</u> - Ensure you have good multidisciplinary buy-in and specific strategies to maintain their engagement. Consider clinical champions to help your efforts. <input type="checkbox"/> <u>Standardise the process</u> - Screening should focus on early identification using a systematised model of care or pathway that defines the tools to be used, who will conduct screening, the timing and frequency of screening, and pathways for treatment referrals appropriate to the setting (see generic pathway). <input type="checkbox"/> <u>Utilise functionality of electronic medical records (EMR)</u> – embed screening and assessment tools within the EMR and streamline referral processes. <input type="checkbox"/> <u>Select one ward/area to begin screening</u> - undergo iterative cycles of change using a recognised model for implementing change in health services. The Plan, Do, Study, Act model⁸ is one such model that can be used to adapt and tailor the process accordingly. |
| Lack of role clarity | <ul style="list-style-type: none"> <input type="checkbox"/> <u>Communication is key</u> – break down silos by talking to staff and keeping everyone involved. <input type="checkbox"/> <u>Use a recognised framework or model to support implementation</u> – The AACCTT framework¹⁰ is one such framework that can be used to define roles and responsibilities of multidisciplinary team members. (see AACCTT framework examples) |
| Inadequate services to refer on to | <ul style="list-style-type: none"> <input type="checkbox"/> <u>Collect local data</u> - use clinical data such as malnutrition or sarcopenia point prevalence survey data to build business case. <input type="checkbox"/> <u>Utilise a framework</u> - for example team mental model¹¹, to develop and refine multidisciplinary services to optimise the success of the team, and importantly clinical and patient-reported outcome and experience measures. <input type="checkbox"/> <u>Connect and network</u> with local services to support transitions of care between your service and other providers. |
| Limited time and/or resources | <ul style="list-style-type: none"> <input type="checkbox"/> <u>Prioritise high risk groups</u> - in health services with limited resources prioritise screening of high-risk patient groups. <input type="checkbox"/> <u>Disinvest to reinvest</u> – consider what new opportunities for care might be realized through disinvesting in low value activities and adopting systemized models of care (see Simple toolkit¹²). |
| Lack of tools/equipment required to screen and assess | <ul style="list-style-type: none"> <input type="checkbox"/> <u>Consider using indirect measures</u> - If you don't have access to tools such as BIA device or hand grip dynamometer or BIA consider using indirect measures of muscle mass and function such as calf-circumference, PG-SGA physical assessment or chair stand test. Consider the training requirements of each. |
| Low motivation for change | <ul style="list-style-type: none"> <input type="checkbox"/> <u>Build your team</u> - include key players in planning. <input type="checkbox"/> <u>Clinical champions</u> - appoint clinical champions in each clinical area to help build motivation for change. <input type="checkbox"/> <u>Use local data</u> – such as audit or activity data to create motivation for change. <input type="checkbox"/> <u>Engage consumers</u> - in the development and evaluation of multidisciplinary services across the continuum of care. <input type="checkbox"/> <u>Evaluate progress</u> and report results. |

User Guide:

- Form a multidisciplinary implementation team within your current health service / organisation.
- Assess current policies/procedures and resources available at your organisation.
- Use this checklist to identify current barriers and tips to overcome them in your organisation.
- Highlight the areas that are feasible and can be changed in consultation with the team/HOD etc.
- Look at exemplars of evidence-based care in practice for practical guidance.
- Implement selected strategies.
- Evaluate progress.

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Implementation theories, models and frameworks

The below paper helps to give the beginner an understanding of implementation science and how the many implementation theories, models and frameworks can be used.

Nilsen P. Making sense of implementation theories, models and frameworks. *Implement Sci.* 2015 Apr 21;10:53. doi: 10.1186/s13012-015-0242-0. ([Pub Med](#))

Process models describing the process of translating research into practice

- *Knowledge to action framework*

Graham ID, Logan J, Harrison MB, Straus SE, Tetroe J, Caswell W, Robinson N. Lost in knowledge translation: time for a map? *J Contin Educ Health Prof.* 2006 Winter;26(1):13-24. doi: 10.1002/chp.47. ([Pub Med](#))

Understanding or explaining what influences implementation outcomes

Determinant frameworks such as those outlined below can be used to understand the barriers and enablers for implementation.

- *Consolidated framework for implementation research (CFIR)*

Damschroder LJ, Reardon CM, Widerquist MAO, Lowery J. The updated Consolidated Framework for Implementation Research based on user feedback. *Implement Sci.* 2022 Oct 29;17(1):75. doi: 10.1186/s13012-022-01245-0. ([Pub Med](#))

- *Theoretical domains framework (TDF)*

Cane J, O'Connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implement Sci.* 2012 Apr 24;7:37. doi: 10.1186/1748-5908-7-37. PMID: 22530986; ([Pub Med](#))

- *The COM-B system*

Michie S, van Stralen MM, West R. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci.* 2011 Apr 23;6:42. doi: 10.1186/1748-5908-6-42. ([Pub Med](#))

Evaluating Implementation

- *RE-AIM framework*

Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *Am J Public Health.* 1999 Sep;89(9):1322-7. doi: 10.2105/ajph.89.9.1322. PMID: 10474547; ([Pub Med](#))

- *Proctor's outcomes for implementation research*

Proctor E, Silmere H, Raghavan R, Hovmand P, Aarons G, Bunger A, Griffey R, Hensley M. Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda. *Adm Policy Ment Health*. 2011 Mar;38(2):65-76. doi: 10.1007/s10488-010-0319-7. ([Pub Med](#))

Frameworks to define implementation strategies

- *AACTT framework*

Presseau J, McCleary N, Lorencatto F, Patey AM, Grimshaw JM, Francis JJ. Action, actor, context, target, time (AACTT): a framework for specifying behaviour. *Implement Sci*. 2019 Dec 5;14(1):102. doi: 10.1186/s13012-019-0951-x. ([Pub Med](#))

- *Proctor's recommendations for specifying and reporting implementation strategies*

Proctor EK, Powell BJ, McMillen JC. Implementation strategies: recommendations for specifying and reporting. *Implement Sci*. 2013 Dec 1;8:139. doi: 10.1186/1748-5908-8-139. ([Pub Med](#))

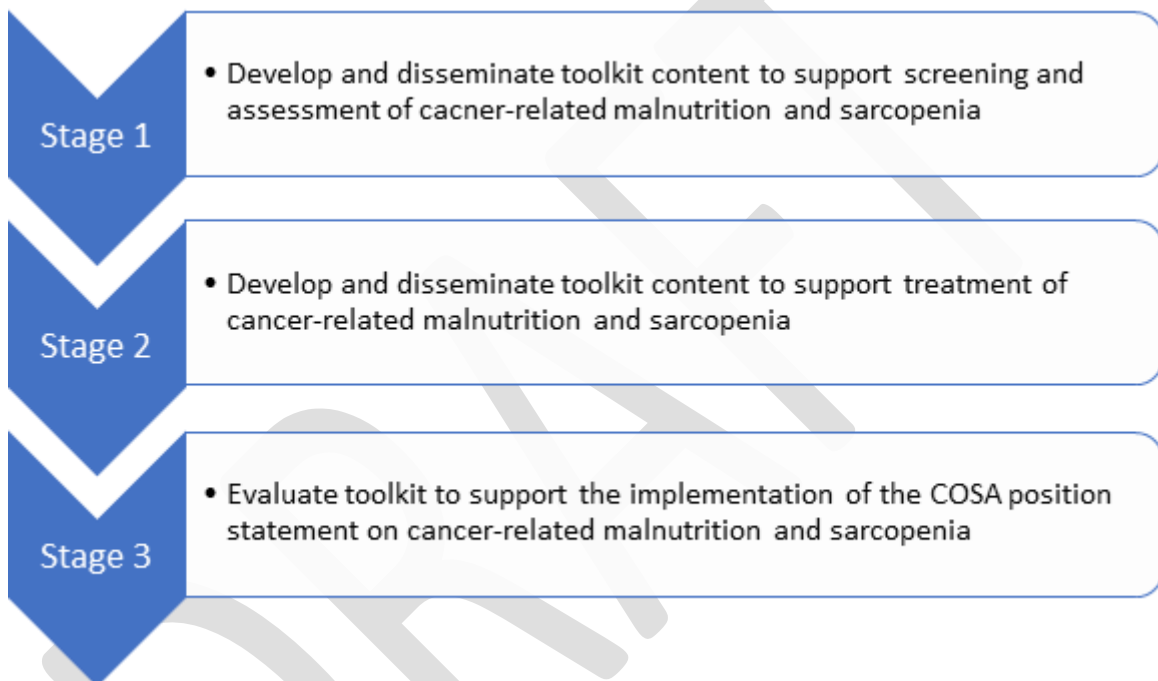
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Enhancements to the toolkit

Next steps

This project forms stage 1 of a larger staged implementation process to develop a toolkit to support implementation of the COSA position statement on cancer-related malnutrition and sarcopenia and evaluate the outcomes of implementation.

The project is planned to be a staged implementation process conducted over three stages:



Feedback from users

We welcome feedback from toolkit users. If you have any comments or suggestions to improve the toolkit please email jane.stewart@petermac.org.

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