



Malnutrition, Myths and Meaningful Referrals: A Nurse's Guide to Oncology Nutrition

Lauren Atkins

Advanced Accredited Practising Dietitian

Senior Oncology Dietitian | Co-Founder | Co-director

OnCore Nutrition
Australia

Disclosures

Thank you to Nutricia for supporting me to be here.



The invisible problem

Up to 70%

of cancer patients
malnourished
(ESPEN, Clin Nutr 2021)

30–60%

sarcopenic – often **invisible** to the naked eye
(Pamoukdjian et al, Clin Nutr 2018)

~165,000

new cancer diagnoses
per year in Australia
(AIHW)

Only 56% of malnourished cancer patients receive any dietetic intervention — and the rate hasn't shifted between national point-prevalence surveys.

Nearly half are slipping through the cracks.

Muscaritoli et al, ESPEN practical guideline: Clinical Nutrition in cancer, Clin Nutr 2021 (prevalence 20–70% depending on tumour type, stage and setting)

Body composition can predict outcomes

across every treatment modality

SURGERY

↑ Leak ↑ SSI

Sarcopenia independently predicts major complications, anastomotic leak, SSI, length of stay and readmission across GI, HPB, head & neck, gynae and urologic cancer surgery.

*Simonsen 2018 GI meta-analysis;
Trejo-Avila 2021 (n=18,891);
Ng 2024 H&N meta-analysis*

CHEMOTHERAPY

↓ Dose intensity

Low muscle mass predicts dose-limiting toxicity and reduced relative dose intensity across breast, lung, GI, pancreatic, ovarian and renal cancers - independent of BMI. Drives dose reductions, delays and early discontinuation.

*Prado 2008 (breast);
Hilmi 2021 meta-analysis;
Davis 2018 review*

RADIOTHERAPY

↑ RT weight loss

Baseline sarcopenia predicts treatment breaks, acute & late RT toxicity (dysphagia, xerostomia, weight loss) and worse survival in head & neck, lung and pelvic cancers receiving (chemo)radiation.

*van Rijn-Dekker 2020 (HNSCC);
Wong 2019 chemoradiation;
Chen 2016 (rectal)*

Sarcopenia is independently associated with significantly higher all-cause mortality across solid tumours (Shachar et al. 2016)

NO CT REQUIRED

What you can see at the bedside.

01

Weight history

Not just current weight - pre-diagnosis weight, rate of loss, intentional or not

02

Visible muscle loss

Temples, clavicles, hands, calves. Loose-fitting clothes patients used to fill out

03

Functional change

Stairs feel harder. Lifting their own child feels harder. Getting up out of chair.

04

Intake observation

"Tell me about a typical day's food" - open question, not "have you been eating?"

Leave the formal assessment to the dietitian and EP/physio. Your intuition is the most valuable addition.

Malnutrition and sarcopenia
aren't side notes - they shape outcomes.

*Up to 70% of people with cancer
experience malnutrition during their illness.*

Muscaritoli et al, ESPEN practical guideline: Clinical Nutrition in cancer, Clin Nutr 2021 (prevalence 20–70% depending on tumour type, stage and setting)

It changes who survives – and how well they live.

Shachar et al, Eur J Cancer 2016 (sarcopenia: HR 1.44 for OS across solid tumours, n=7,843) · Bossi et al, Nutrients 2021

Nutrition during treatment

What can nutrition intervention do to the cancer experience?

PREVENT

Prevent and manage malnutrition and sarcopenia

RECOVER

Enhance recovery after surgery, RT and between chemo cycles

REDUCE

Reduce hospital admissions and length of stay

BODY COMP

Improve body composition

TOLERATE

Improve treatment tolerance & reduce side effects

RESPOND

Improve response to cancer treatment

WELLBEING

Improve mood, energy levels, quality of life

PROTECT

Reduce risk of recurrence and chronic health issues



SARCOPENIC OBESITY

Sarcopenic obesity, *and muscle as metabolic reserve*

SARCOPENIC OBESITY • Low muscle underneath an overweight BMI – higher risk than either phenotype alone.

Muscle is what you spend when you're sick.
The patient with more in the bank tolerates more.

NOW

Muscle preservation

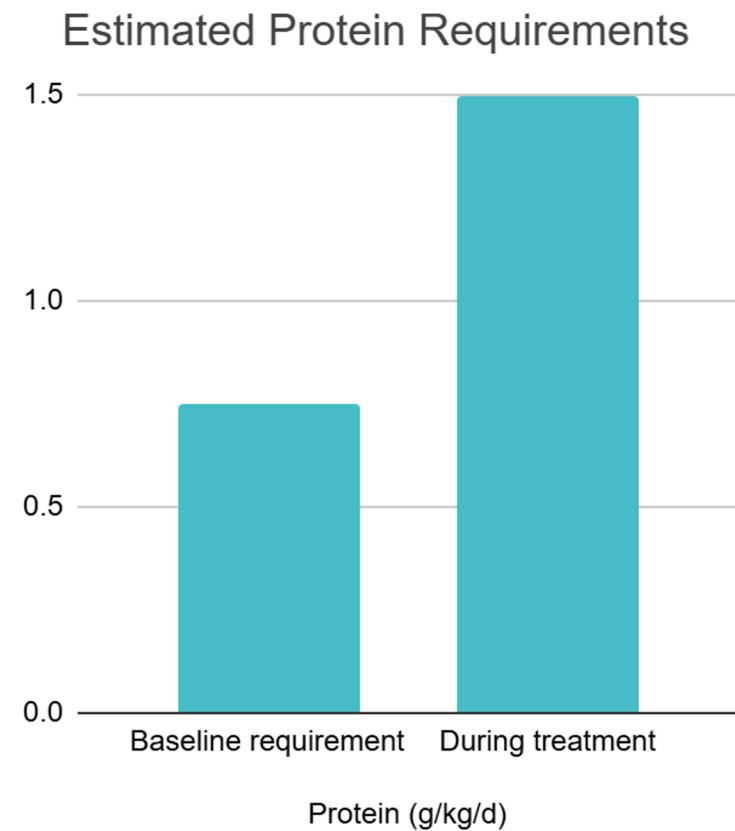
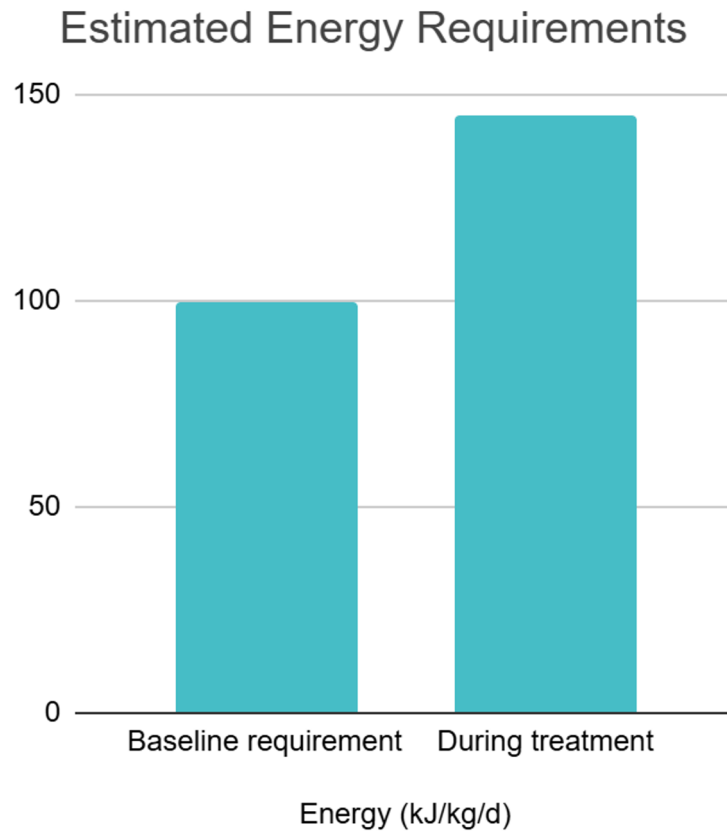
is a current priority

LATER

With muscle preserved

fat loss is more achievable

Nutritional requirements



Weight Loss, Malnutrition & Sarcopenia



Why it happens

Protein catabolism during cancer treatment

COMBINED WITH

Inadequate protein and/or energy intake

Immediate effects

- Lean muscle mass breakdown
- Reduced strength & physical function
- Lower treatment tolerance & immune function
- Slower wound healing & recovery

Long-term consequences

- Slowed metabolism - increased risk of weight gain as fat post-treatment
- Metabolic syndrome & chronic disease risk elevated
- Impaired long-term survivorship outcomes

Malnutrition & sarcopenia can occur in people of ALL body sizes - BMI alone is not a reliable indicator



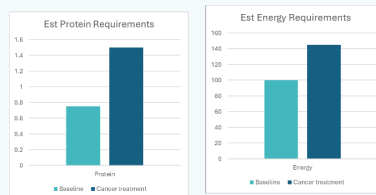
NUTRITION DURING TREATMENT

Nutrition during treatment



Cancer itself increases metabolic demand

- Can increase nutritional requirements by up to 100% from baseline



Physical presence of tumours can create nutritional challenges

- Pain, obstruction, stricture or compression (e.g. oral, gastrointestinal)
- Alter digestion and/or absorption (e.g. gastrointestinal)

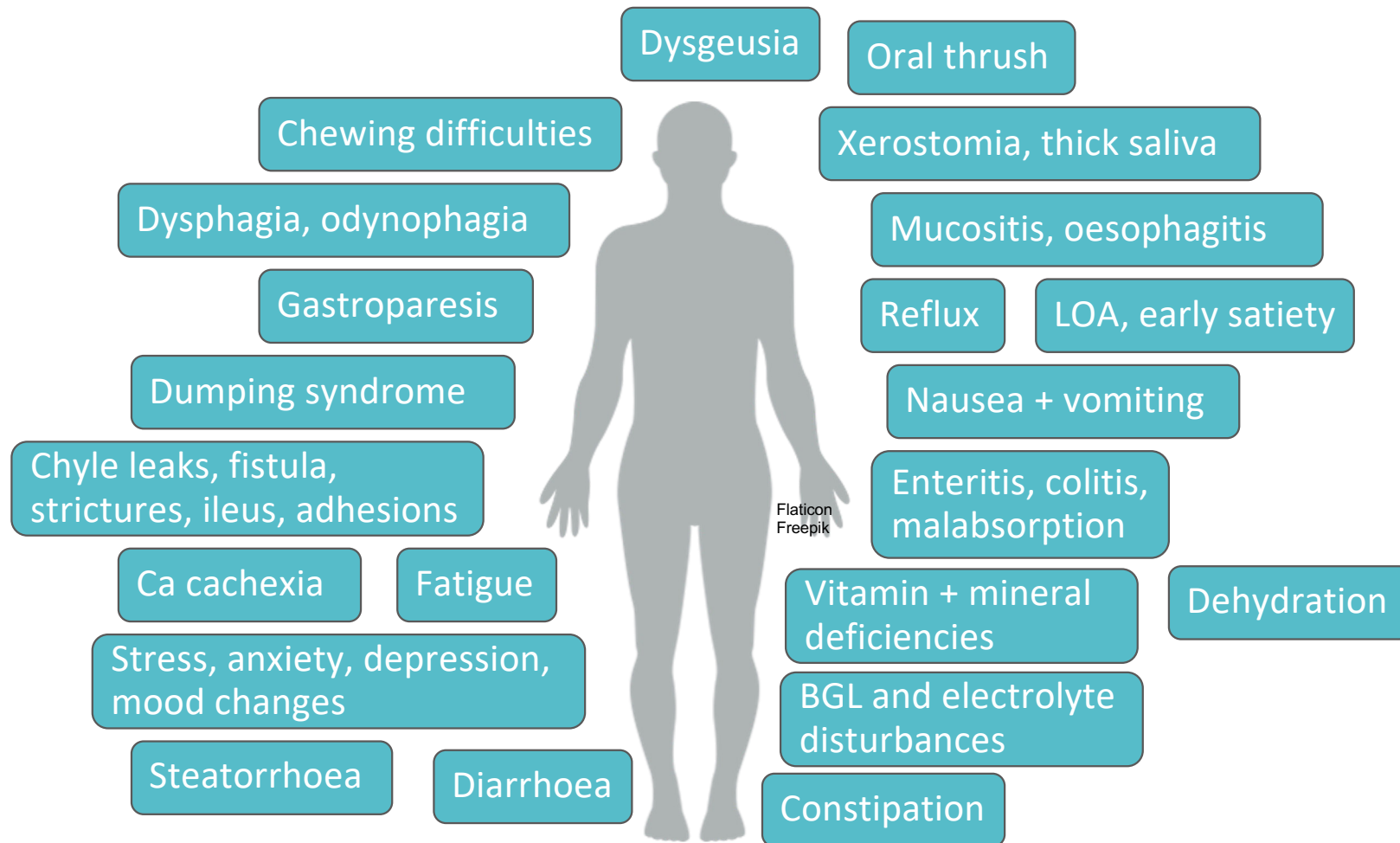
Nutrition impact Sx (NIS) further compound this

- Up to 88% of cancer patients present with NIS
- Up to 37% present with more than one NIS prior to receiving any treatment

Psychosocial factors

- Associated with Dx, Tx and beyond - can impact appetite, eating habits, activity levels, food and body relationships, intuition and trust.

Nutrition impact symptoms





ORAL NUTRITION IMPACT SYMPTOMS

Managing oral changes



YOU MAY HAVE TRIED

- Analgesia, antifungals
- Artificial salivas
- Mouthwashes
- Wooden/plastic cutlery
- Herbs, spices, bland, flavour experimentation
- Texture, temperature and mouthfeel

WE COULD CONSIDER

- Analgesia timing
- Oral-adhering discs
- Soda water
- Miraculin
- **EVOO**
- **Honey + instant coffee**

Extra-virgin olive oil (EVOO)



THE STUDY

2007 study: Single-blinded, open-label, cross-over, n=40.
Randomly assigned to olive oil, betaine, xylitol or routine care;
crossed over to another regimen after 1 week.
Olive oil intervention **increased salivary flow rates, reduced xerostomia complaints and improved QOL.**

EXPERT VIEW

“One of the simplest and cheapest substances that has shown benefit as an oral lubricant in patients with xerostomia.”

— Royal Australian College of General Practitioners (RACGP)

Side effects: nil reported; calories ✓ **Contraindications:** allergy

Honey and coffee



THE STUDY

2014 RCT: honey + coffee mixture **more effective than topical steroid** for mucositis treatment.

Physician-assessed using the WHO Oral Toxicity Scale for oral mucositis.

TRY IT

Ingredients: 300g honey + 20g instant coffee

Method:

- Warm honey jar until runny
- Stir in dried coffee until dissolved
- Add 10ml mixture to warm water
- **Sip / swish + spit: 10ml every 3 hrs**

Mechanism: Flavonoids in honey show anti-inflammatory, antimicrobial and anticancer activity; raise gastric mucosal glutathione peroxidase / superoxide dismutase; reduce inflammatory cytokines.

Side effects: may elevate BGLs | **Contraindications:** allergy, caffeine sensitivity



APPETITE NUTRITION IMPACT SYMPTOMS

Managing loss of appetite and early satiety



YOU MAY HAVE TRIED

- HPHE
- Small frequent meals
- Eating by the clock
- Nourishing fluids
- Cold/room temperature foods
- Support with meal planning
- Oral Nutrition Supplements (ONS)

WE COULD CONSIDER

- Medpass
- Fresh air and movement
- **Distraction vs intuition**
- **Real time support**
- **When to initiate and ONS**

Practical strategies



DISTRACTION VS INTUITION

- Engage friends, family
- Conversation
- Change of scenery, al fresco, picnics
- Phone calls, video calls
- Reading
- Puzzling
- Word Finds, crosswords, Words with Friends etc
- Favourite shows, movies
- Colouring, painting
- Art, craft
- Sensory or fidget toys

REAL TIME SUPPORT

Your support in the moment - literature supports its profound impact!

Time and resources make this challenging (impossible).

- Addressing barriers
- Psychological support
- MDT voice

Tassone, E.C., Tovey, J.A., Paciepnik, J.E., Keeton, I.M., Khoo, A.Y., Van Veenendaal, N.G. & Porter, J. (2015). Should we implement mealtime assistance in the hospital setting? A systematic literature review with meta-analyses. *Journal of Clinical Nursing*, 24(19-20), 2710–2721.

Cunningham, J., Murphy, M., & Banks, M. (2014). The patient's perspective of hospital mealtimes. *Journal of Clinical Nursing*, 23(15-16), 2351–2359.

IF NOT YOU, THEN WHO?

ONS as a clinical tool

1

Intake below ~75% of usual

For more than a few days. Not a one-off bad day. A pattern.

2

Documented weight loss

Any unintentional loss. $\geq 5\%$ is already malnourished - earlier is better.

3

High-risk presentation

Pre-treatment, pre-op, before high-toxicity regimens, post major resection, ostomy formation.

Starting a standard ONS while a dietetic referral is pending is within scope.

BMI hides risk. Even patients in larger bodies eating poorly during treatment lose muscle – and sarcopenic obesity carries **>50% higher mortality risk**.

Early ONS supports muscle preservation regardless of BMI.

Liu et al., JAMA Netw Open 2024;7(6):e2417115. ESPEN Clinical Nutrition in Cancer 2021.



NAUSEA AND VOMITING

Managing nausea and vomiting



YOU MAY HAVE TRIED

- Small frequent meals
- Cold/room temperature foods
- Avoiding food smells
- Support with meal planning
- Antiemetics

YOU COULD CONSIDER

- CAMs - acupuncture, aromatherapy, hypnotherapy, music therapy
- **Aromatherapy - inhaled isopropyl alcohol**
- **Education**

Aromatherapy for nausea



THE STUDY

2019 RCT, ED pts w n+v. Three arms:

1. Inhaled isopropyl alcohol + 4 mg oral ondansetron
2. Inhaled isopropyl alcohol + oral placebo
3. Inhaled saline placebo + 4 mg oral ondansetron

Conclusion: Aromatherapy with or without oral ondansetron provides greater nausea relief than oral ondansetron alone.

MECHANISM

Isopropyl alcohol may influence neurotransmission at sites that activate the chemoreceptor trigger zone.

Extremely cheap and readily available.



Side effects: no reported adverse reactions in the adult population as an inhaled vapor.

Pellegrini J, DeLoge J, Bennett J, Kelly J. Comparison of inhalation of isopropyl alcohol vs promethazine in the treatment of postoperative nausea and vomiting (PONV) in patients at high risk for developing PONV. AANA J. 2009;77(4):293-299.

Antiemetic agents at a glance



Antiemetic agent	Serotonin-receptor antagonists	Glucocorticoids	Benzamides	Neurokinin antagonists	Benzodiazepines	Atypical antipsychotic	Other
Mechanism of action	Block serotonin from interacting with the 5-HT ₃ receptor in gut + CNS.	Inhibition of prostaglandin, decreased serotonin	D ₂ + 5-HT ₃ receptor antagonists	Block neurokinin in CNS + PNS	Slowing activity in the brain to allow for relaxation.	Multi-receptor (D ₂ , 5-HT ₃ , H ₁ , M ₁ , α ₁) blockade in CNS	Cannabinoid therapy Haloperidol (D ₂ antagonist) Antihistamines (e.g. Doxylamine, Cyclizine)
Notes	Dissolving tablet SE: constipation	Often prescribed for 2 days post CTx	SE: diarrhoea	Often administered prior to CTx	Anticipatory nausea	Off-label. 5-10mg nocte (sedation manages drowsiness; appetite↑, anxiety↓)	
Examples	Ondansetron, granisetron	Dexamethasone	Metoclopramide	Aprepitant	Lorazepam	Olanzapine	
Explanation	Blocks n+v signals in brain, slows gut down	First day off dex can = most n+v	Relax pyloric sphincter, allows food to pass	Blocks signals in brain to prevent n+v	Calm the body and brain's response to food	Acts on multiple nausea pathways; useful in refractory CINV	

Managing nausea and vomiting



Oman Medical Journal (2011) Vol. 26, No. 3: 155-159
DOI 10. 5001/omj.2011.38

Review Article

Patient Medication Adherence: Measures in Daily Practice

Conclusion

Patient medication non adherence is a major medical problem globally. There are many inter related reasons for the same. Though patient **education is the key to improving compliance**, use of compliance aids, proper motivation and support is also shown to increase medication adherence. Health care professionals should

KEY TAKEAWAY

Patient medication non-adherence is a major global problem with many inter-related causes. **Patient education is the key to improving compliance** — alongside compliance aids, motivation and support.

Health care professionals should actively engage patients in their treatment plan.

Atreja A, Bellam N, Levy SR. Strategies to enhance patient adherence: making it simple. MedGenMed. 2005;7(1):4. (Reviewed in Oman Med J 2011;26(3):155-9)



MYTH BUSTING AND FAST FACTS



Common dietary concerns

Sugar feeds cancer | Ketogenic Diet

Sugar feeds everything. Cancer feeds *off* everything

This is an unfair oversimplification. Body will end up breaking down its muscle stores.
Choose low GI carbohydrates most often.

Intermittent Fasting

Human studies lacking. Must avoid malnutrition / sarcopenia. May help protect healthy cells from SEs while potentially making cancer cells vulnerable.

Organic

Include plenty of fresh, plant-based produce, organic or not.

Large reviews find inconclusive evidence.
Personal preference and access is important.
Wash fruit + veg before eating.

High dose vitamins & minerals

Caution - we need enough, but not too much, preferably from whole foods.

Taking high doses of supplements can reduce how well some cancer treatments (RT, chemo) work.

Dairy Products

In many cases, dairy is protective!

Colorectal → possibly protective. Prostate → may increase risk. Other Ca types → inconclusive.

I should go vegan

Focus on adding in more plants, rather than avoiding animal products.

Limit/avoid processed meats.
Aim for <500g red meat per week.
Include more oily fish, poultry, eggs, dairy, tofu, legumes, nuts, seeds.



MEANINGFUL REFERRALS

SCREENING TOOLS MISS. YOU DON'T,



Trust your intuition.

*Screening tools are great, but nurses are greater.
Refer even when the score doesn't quite hit.*

Screening tools miss:

- The patient whose weight looks stable because they were in a larger body to start with (including those happy with weight loss!)
- The patient who is eating - but eating not getting nutritional quality
- The patient who has altered their diet, added CAMs, cutting out dairy, worried about sugar
- The motivated survivor who wants to do all they can
- The patient who isn't losing weight like they expected (silver lining) and is disappointed about it

Cost of an unnecessary referral: a 10-minute reassuring conversation with a dietitian.

Cost of a missed referral: muscle, treatment delay, sometimes survival.

What nurses can (and do!) do - Your vital role



RECOGNISE

- Weight history – not just current weight
- Visible muscle loss; strength & functional change
- Observe intake & % usual at regular intervals
- MST as a prompt – it doesn't replace a nursing degree
- Symptoms that impact nutrition (NIS)

INITIATE

- Standard ONS trial when intake drops
- Protein at every meal
- Ask about CAMs & supplements; correct nutrition myths
- Don't wait for the referral to start support
- Small frequent meals; nourishing fluids

REFER

- Refer at risk, not at crisis
- 5% weight loss is already too late (malnutrition diagnosis)
- Pre-op, pre-treatment for high-toxicity regimens
- Add MST score, weight change & NIS to referral
- Connect to external resources where helpful

REINFORCE

- Patients respect and hear your advice – 3× before it lands
- Every cycle, not just at start
- Stay curious – eating, symptoms, body composition
- Celebrate small wins; support family too
- Support and reinforce dietitian's recommendations

Finding a Dietitian



- Oncology dietitian
 - Treating hospital
 - Dietitians Australia - Find an APD
- CDM plans
 - See your GP for a 'care plan' plan and access Medicare rebates for private dietitian consults
- Private health rebates



RECOMMENDATION
After a cancer diagnosis: follow our Recommendations, if you can
Check with your health professional what is right for you

GOAL All cancer survivors¹ should receive nutritional care and guidance on physical activity from trained professionals

GOAL Unless otherwise advised, and if you can, all cancer survivors are advised to follow the Cancer Prevention Recommendations as far as possible after the acute stage of treatment

¹ Cancer survivors are people who have been diagnosed with cancer, including those who have recovered from the disease.

All cancer survivors (past and present) should receive nutritional care and guidance on physical activity from trained professionals

Super-charge your referrals

- | | | |
|-------------------------------|-------------------------|----------------|
| ● MST screen | ● % usual intake | ● List any NIS |
| ● Wt + Wt change (time frame) | ● Dietary modifications | ● ONS, CAMs |

Where to find us

How we can help – and how to refer.

Oncology Dietitians · Prehab & ERAS · During Treatment · Survivorship Care

FREE INTRO CALLS

oncorenutrition.com/15-minutes-free

PHONE

03 9088 4252

DIRECT

lauren.atkins@oncorenutrition.com

SEE US

Caulfield · Telehealth nationally

EMAIL

enquiries@oncorenutrition.com

WEB

oncorenutrition.com

PODCAST

OnCore Nutrition Two Peas in a Podcast

Medicare CDM, Private Health, NDIS · Clinical letters returned · Referrals welcome



References



- Symptoms and treatment burden associated with cancer treatment: results from a cross-sectional national survey in the U.S. Henry DH, Viswanathan HN, Elkin EP, Traina S, Wade S, Cella D. *Support Care Cancer*. 2008;16:791–801. [PubMed] [Google Scholar] [Ref list]
- Katta B, Vijayakumar C, Dutta S, Dubashi B, Nelamangala Ramakrishnaiah VP. The Incidence and Severity of Patient-Reported Side Effects of Chemotherapy in Routine Clinical Care: A Prospective Observational Study. *Cureus*. 2023 Apr 29;15(4):e38301. doi: 10.7759/cureus.38301. PMID: 37261144; PMCID: PMC10226821.
- Kubrak C, Olson K, Baracos V E, 2013, 'The head and neck symptom checklist: an instrument to evaluate nutrition impact symptoms effect on energy intake and weight loss', *Supportive Care in Cancer*, vol. 21, no. 11, pp. 3127-36.
- Milliron BJ, Packel L, Dychtwald D, Klobodu C, Pontiggia L, Ogbogu O, Barksdale B, Deutsch J. When Eating Becomes Torturous: Understanding Nutrition-Related Cancer Treatment Side Effects among Individuals with Cancer and Their Caregivers. *Nutrients*. 2022 Jan 14;14(2):356. doi: 10.3390/nu14020356. PMID: 35057538; PMCID: PMC8781744.
- Raeessi MA, Raeessi N, Panahi Y, Gharai H, Davoudi SM, Saadat A, Karimi Zarchi AA, Raeessi F, Ahmadi SM, Jalalian H. "Coffee plus honey" versus "topical steroid" in the treatment of chemotherapy-induced oral mucositis: a randomised controlled trial. *BMC Complement Altern Med*. 2014 Aug 8;14:293. doi: 10.1186/1472-6882-14-293. PMID: 25106776; PMCID: PMC4150938.
- Ship JA, McCutcheon JA, Spivakovsky S, Kerr AR. Safety and effectiveness of topical dry mouth products containing olive oil, betaine, and xylitol in reducing xerostomia for poly-pharmacy induced dry mouth. *J Oral Rehabil* 2007;34(10):724–32. Search PubMed
- Efficacy and Safety of Habitual Consumption of a Food Supplement Containing Miraculin in Malnourished Cancer Patients: The CLINMIR Pilot Study. *Nutrients* 2024, 16 (12), Implications of Taste and Smell in Eating Behaviors and Health Outcomes <https://www.mdpi.com/2072-6643/16/12/1905>
- Treatment of taste alterations in chemotherapy patients using the "miracle fruit": Preliminary analysis of a pilot study. *Journal of Clinical Oncology* https://ascopubs.org/doi/abs/10.1200/jco.2010.28.15_suppl.e19523
- Pilot study of "miracle fruit" to improve food palatability for patients receiving chemotherapy. *Clinical Journal of Oncology Nursing*. <https://pubmed.ncbi.nlm.nih.gov/23022943/>
- Synsepalum dulcificum and varied taste occurring postradiation trial. *Journal of Otolaryngology-Head and Neck Surgery*. <https://journals.sagepub.com/doi/abs/10.1177/0194599812451426a168>
- Complementary and integrative medicines used by cancer patients to cope with chemotherapy-related taste alterations. *Journal of Holistic Nursing and Midwifery*. <https://hnmj.gums.ac.ir/article-1-1795-en.html>
- <https://www.mskcc.org/cancer-care/integrative-medicine>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4150938/>
- <https://www.sciencedirect.com/science/article/abs/pii/S0901502716301850>
- <https://www.mskcc.org/cancer-care/integrative-medicine/herbs/manuka-honey>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4150938/>
- Hauser JM, Azzam JS, Kasi A. Antiemetic Medications. [Updated 2022 Sep 26]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK532303/>
- Pellegrini J, DeLoge J, Bennett J, Kelly J. Comparison of inhalation of isopropyl alcohol vs promethazine in the treatment of postoperative nausea and vomiting (PONV) in patients identified as at high risk for developing PONV. *AANA J*. 2009;77(4):293-299. [PubMed]
- Athavale A, Athavale T, Roberts DM. Antiemetic drugs: what to prescribe and when. *Aust Prescr*. 2020 Apr;43(2):49-56. doi: 10.18773/austprescr.2020.011. Epub 2020 Apr 1. PMID: 32346211; PMCID: PMC7186277.m

References



- <https://crohnsandcolitis.org.au/living-with-crohns-colitis/lifestyle/nutrition/managing-a-high-output-stoma-in-ibd/>
- Robinson E, Aveyard P, Daley A, Jolly K, Lewis A, Lycett D, Higgs S. Eating attentively: a systematic review and meta-analysis of the effect of food intake memory and awareness on eating. *Am J Clin Nutr*. 2013 Apr;97(4):728-42. doi: 10.3945/ajcn.112.045245. Epub 2013 Feb 27. PMID: 23446890; PMCID: PMC3607652.
- Jimmy B, Jose J. Patient medication adherence: measures in daily practice. *Oman Med J*. 2011 May;26(3):155-9. doi: 10.5001/omj.2011.38. PMID: 22043406; PMCID: PMC3191684.
- <https://www.foodstandards.gov.au/sites/default/files/food-standards-code/proposals/Documents/P1030%20EDs%20Consultation%20Paper.docx?csf=1&e=ZYmNQI>
- April MD, Oliver JJ, Davis WT, Ong D, Simon EM, Ng PC, Hunter CJ. Aromatherapy Versus Oral Ondansetron for Antiemetic Therapy Among Adult Emergency Department Patients: A Randomized Controlled Trial. *Ann Emerg Med*. 2018 Aug;72(2):184-193. doi: 10.1016/j.annemergmed.2018.01.016. Epub 2018 Feb 17. Erratum in: *Ann Emerg Med*. 2019 May;73(5):552. doi: 10.1016/j.annemergmed.2019.03.036. PMID: 29463461.
- <https://crohnsandcolitis.org.au/living-with-crohns-colitis/lifestyle/nutrition/managing-a-high-output-stoma-in-ibd/>
- Robinson E, Aveyard P, Daley A, Jolly K, Lewis A, Lycett D, Higgs S. Eating attentively: a systematic review and meta-analysis of the effect of food intake memory and awareness on eating. *Am J Clin Nutr*. 2013 Apr;97(4):728-42. doi: 10.3945/ajcn.112.045245. Epub 2013 Feb 27. PMID: 23446890; PMCID: PMC3607652.
- Jackson SE, Beeken RJ, Wardle J. Perceived weight discrimination and changes in weight, waist circumference, and weight status. *Obesity (Silver Spring)*. 2014 Dec;22(12):2485-8. doi: 10.1002/oby.20891. Epub 2014 Sep 11. PMID: 25212272; PMCID: PMC4236245.
- Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity (Silver Spring)*. 2009 May;17(5):941-64. doi: 10.1038/oby.2008.636. Epub 2009 Jan 22. PMID: 19165161.
- Isenring EA, Zabel R, Bannister M, Brown T, Findlay M, Kiss N, et al. Updated evidence based practice guidelines for the nutritional management of patients receiving radiation therapy and/or chemotherapy. *Nutrition and Dietetics*. 2013;70(4):312-324.
- Arends J, Bodoky B, Bozzetti F, Fearon D, Muscaritoli M, Selgaf G et al. ESPEN guidelines on enteral nutrition: non-surgical oncology. *Clin Nutr*. 2006;25:245–59.
- Arends J, Bachmann P, Baracos V, Barthelemy N, Bertz H, Bozzetti F et al. ESPEN guidelines on nutrition in cancer patients. *Clin Nutr*. 2017 Feb;36(1):11-48. doi: 10.1016/j.clnu.2016.07.015. Epub 2016 Aug 6. PMID: 27637832.
- Oncology Nutrition. An essential resource for Dietitians on the nutritional management of cancer. Version 2.0. Peter MacCallum Cancer Centre. 2018.
- <https://www.wcrf.org/dietandcancer/>
- <https://www.cancervic.org.au/for-health-professionals/optimal-care-pathways>
- Nelson G, Bakkum-Gamez J, Kalogera E, Glaser G, Altman A, Meyer LA, Taylor JS, Iniesta M, Lasala J, Mena G, Scott M, Gillis C, Elias K, Wijk L, Huang J, Nygren J, Ljungqvist O, Ramirez PT, Dowdy SC. Guidelines for perioperative care in gynecologic/oncology: Enhanced Recovery After Surgery (ERAS) Society recommendations-2019 update. *Int J Gynecol Cancer*. 2019 May;29(4):651-668. doi: 10.1136/ijgc-2019-000356. Epub 2019 Mar 15. PMID: 30877144.
- Muscaritoli M, Arends J, Bachmann P, Baracos V, Barthelemy N, Bertz H, Bozzetti F, Hütterer E, Isenring E, Kaasa S, Krznaric Z, Laird B, Larsson M, Laviano A, Mühlebach S, Oldervoll L, Ravasco P, Solheim TS, Strasser F, de van der Schueren M, Preiser JC, Bischoff SC. ESPEN practical guideline: Clinical Nutrition in cancer. *Clin Nutr*. 2021 May;40(5):2898-2913. doi: 10.1016/j.clnu.2021.02.005. Epub 2021 Mar 15. PMID: 33946039.
- Nelson, G., Altman, A. D., Nick, A., Meyer, L. A., Ramirez, P. T., Achari, C., ... & Fagotti, A. (2016). Guidelines for pre- and intraoperative care in gynecologic/oncology surgery: Enhanced Recovery After Surgery (ERAS®) Society recommendations — Part I. *Gynecologic Oncology*, 140(2), 313-322.

References (cont.)



- 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):629-635. doi: 10.1016/S1470-2045(08)70153-0.
- Shachar SS, Williams GR, Muss HB, Nishijima TF. Prognostic value of sarcopenia in adults with solid tumours: a meta-analysis and systematic review. *Eur J Cancer.* 2016;57:58-67. doi: 10.1016/j.ejca.2015.12.030.
- Pamoukdjian F, Bouillet T, Lévy V, Soussan M, Zelek L, Paillaud E. Prevalence and predictive value of pre-therapeutic sarcopenia in cancer patients: a systematic review. *Clin Nutr.* 2018;37(4):1101-1113.
- Bossi P, Delrio P, Mascheroni A, Zanetti M. The spectrum of malnutrition/cachexia/sarcopenia in oncology according to different cancer types and settings: a narrative review. *Nutrients.* 2021;13(6):1980.
- Liu et al. Association of malnutrition with outcomes in patients with cancer. *JAMA Netw Open.* 2024;7(6):e2417115.
- Simonsen C, et al. Sarcopenia and postoperative complication risk in gastrointestinal surgical oncology: a meta-analysis. 2018.
- Trejo-Avila M, et al. Sarcopenia predicts worse postoperative outcomes and decreased survival rates in patients with colorectal cancer: a systematic review and meta-analysis (n=18,891). 2021.
- Ng A, et al. Sarcopenia and survival outcomes in head and neck cancer: a systematic review and meta-analysis. 2024.
- Hilmi M, et al. Body composition and sarcopenia in oncology: prognostic and predictive value — a meta-analysis. 2021.
- Davis MP, Panikkar R. Sarcopenia associated with chemotherapy and targeted agents for cancer therapy: a review. 2018.
- van Rijn-Dekker MI, et al. Impact of sarcopenia on survival and treatment outcomes in head and neck squamous cell carcinoma (HNSCC). 2020.
- Wong A, et al. Sarcopenia and outcomes in patients undergoing chemoradiation. 2019.
- Chen WZ, et al. Impact of sarcopenia on outcomes in patients with rectal cancer. 2016.
- Atreja A, Bellam N, Levy SR. Strategies to enhance patient adherence: making it simple. *MedGenMed.* 2005;7(1):4.