

# Nutritional management of pancreatic cancer

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## Conflicts of interest

#### Research funded by PCUK and NET patient foundation

Travel and education grants: Mylan and IPSEN



## Overview

Nutritional issues	Aims of dietetic input	Chemotherapy	Surgery
Small intestinal bacterial overgrowth	Bile acid malabsorption	Dietary advice	Research



## Poll

Should all patients diagnosed with pancreatic cancer be referred for dietetic input?

- Yes
- No
- Only if MUST > 2



## Nutritional issues in pancreatic cancer

Weight loss at diagnosis is common in pancreatic cancer

- Many causes:
  - Anorexia (loss of appetite)
  - Cachexia
  - Malabsorption
  - Low mood/anxiety
  - Undiagnosed diabetes
  - Treatment side effects
- 85% patients fulfil criteria of cachexia (Hendifar et al 2018)
- Pancreatic exocrine insufficiency (PEI)
  - >80% with resected disease
  - 92% in advanced disease



## Early dietetic input is key!



## Importance of early dietetic input

- Weight loss:
  - adversely affects QoL & overall survival (OS) (Fearon et al 2012, Carnie et al 2020)
  - affects ability to receive & tolerate treatment (Bachmann et al 2008)
- Stabilisation of weight is associated with improved survival and QoL in inoperable pancreatic cancer (Davidson et al 2014)
- Good nutritional status prior to adjuvant chemotherapy = more likely to complete chemotherapy, in turn impacting on survival (Valle et al 2014)

**Target weight loss before treatment starts** 



## Pancreatic exocrine insufficiency (PEI)

PEI defined as "a reduction in pancreatic enzyme activity in the intestinal lumen to a level below the threshold required to maintain normal digestion." (Lindkvist, 2013)



## PEI - causes

• Insufficient production of pancreatic enzymes, due to; pancreatic resection, acute necrotizing

pancreatitis or pancreatitis with calcific changes

- Pancreatic duct obstruction caused by head of pancreas cancers
- Change in the intestinal environment, (reduced intestinal pH) making the enzymes produced ineffective
- Somatostatin analogue-induced



## Pancreatic enzyme replacement therapy (PERT)

#### NICE guidelines [NG85] 1.6 Nutritional management

- 1.6.1 Offer enteric-coated pancreatin for people with unresectable pancreatic cancer.
- 1.6.2 Consider enteric-coated pancreatin before and after pancreatic cancer resection.







## Refractory symptoms

Referral to gastroenterology to rule out other pathology (see Figure 2B)

A "If a patient is prescribed Nutrizym 22 at initial assessment and would prefer to continue with this medication, titrate up the dose accordingly to above recommendations as required.

If symptoms persist despite high dose of PERT, referral to gastroenterology is recommended to rule out other pathology:



already)

If taking high dose PERT and PPI with no improvement to symptoms.... Needs investigation



## Small Intestinal Bacterial Overgrowth

#### Definition

Where the small intestine is colonised with excessive microorganisms usually found in the large intestine (Achufusi et al, 2020).

Imbalance to microorganisms in gut can disrupt digestive system

#### Causes

Surgery (panNET and adenocarcinoma) Pancreatic exocrine insufficiency Use of Proton pump inhibitors Impaired immune system (chemo)



## Small Intestinal Bacterial Overgrowth

#### Symptoms

- Diarrhoea
- Greasy & pale stool
- Wind/bloating
- Weight loss
- Nutritional deficiencies

#### Diagnosis

Breath test

Initiate treatment if high level of suspicion

#### Treatment

Systemic antibiotics (Rifaximin)





## Bile Acid Malabsorption

Bile acids produced by liver, stored in the gallbladder, released into the duodenum after dietary fat intake.

Key role in breaking down & absorbing lipids and fat-soluble vitamins. Usually reabsorbed – if disrupted = BAM

#### **Diagnosis:**

SeHCAT scan (nuclear medicine test) = 'gold-standard'

- Artificial bile acid SeHCAT is swallowed in a capsule or drink
- 1<sup>st</sup> scan (same day) looks at how much artificial bile acid is in the body (starting amount)
- 2<sup>nd</sup> scan (after one week) looks at how much artificial bile has been retained.
- Result = how much bile acid is lost from the body and if mal-absorbing.

Sometimes, doctors may prescribe treatment instead of testing = *trial of therapy* 



## Bile Acid Malabsorption

#### Treatment:

- Bile acid sequestrants:
  - Colesevelam (tablet)
  - Colestipol (powder)
  - Cholestyramine (powder)

- Low fat diet (<40g fat/day)
  - Can help symptoms (Jackson et al 2017)
  - Should be used with caution in a high-risk of malnutrition population



#### <u>Fig 1.</u>

SeHCAT screening algorithm. Patients enrolled in this study were managed depending on their SeHCAT 7-day retention. BAD = bile acid diarrhoea; BAM = bile acid malabsorption; GI = gastrointestinal; SeHCAT = selenium-75 homocholic acid taurine.



## Bile Acid Malabsorption

#### Tips:

- Take medication for at least 10 days to see if works
- Leave 4 hour gap with other medications
  - Impact on absorption of medications
- Monitor vitamins A, D, E & K (Gee et al 2021)
  - Impact on absorption of fat-soluble vitamins
- Monitor vitamin B12 (Gee et al 2021)
- Monitor stool type (Bristol stool chart)



#### Article

**Bile Acid Malabsorption as a Consequence of Cancer Treatment: Prevalence and Management in the National Leading Centre** 

MDPI

Caroline Gee<sup>1</sup>, Catherine Fleuret<sup>1</sup>, Ana Wilson<sup>1,2</sup>, Daniel Levine<sup>1</sup>, Ramy Elhusseiny<sup>1</sup>, Ann Muls<sup>1</sup>,



### Anorexia

#### Caused by the cancer +/or treatment

Assess in all patients

• Focuses intervention

#### Tips:

Energy/protein-dense foods

Little and often

Exercise/fresh air to stimulate appetite

Help with cooking

#### REVIEW PAPER: PDF ONLY

#### The Problem of Appetite Loss After Major Abdominal Surgery A Systematic Review

Wagner, Martin MD<sup>\*,†,‡</sup>; Probst, Pascal MD, MSC<sup>\*,†</sup>; Haselbeck-Koebler, Michael<sup>\*,‡</sup>; Brandenburg, Johanna M.<sup>\*,‡</sup>; Kalkum, Eva PhD<sup>†</sup>; Störzinger, Dominic PhD<sup>§</sup>; Kessler, Jens MD<sup>¶</sup>; Simon, Joe J. PhD<sup>||</sup>; Friederich, Hans-Christoph MD<sup>||</sup>; Angelescu, Michaela MD<sup>\*</sup>; Billeter, Adrian T. MD, PhD<sup>\*</sup>; Hackert, Thilo MD<sup>\*</sup>; Müller-Stich, Beat P. MD<sup>\*,‡</sup>; Büchler, Markus W. MD<sup>\*</sup>

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Annals of Surgery: January 27, 2022 - Volume - Issue doi: 10.1097/SI A.0000000000005379



### Ascites

#### Symptoms:

- Abdomen swelling & discomfort
- Poor appetite
- Early satiety
- Indigestion
- Nausea/vomiting
- Constipation

Can lead to poor nutritional intake, weight loss and delays in treatment

Remember to calculate • nutritional requirements using 'dry' weight



## Anti-cancer treatments



## Chemotherapy

Patients with ≥5% of weight loss at week 4 of palliative chemotherapy have shorter OS regardless of response to treatment

Patients undergoing triplet chemotherapy are more likely to develop ≥5% weight loss at week 4 of treatment

Early intervention is vital to minimise the detrimental impact of early weight loss during palliative chemotherapy.



Pancreatology Volume 20, Issue 8, December 2020, Pages 1682-1688



Impact on prognosis of early weight loss during palliative chemotherapy in patients diagnosed with advanced pancreatic cancer

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## Weight loss ≥5% at week 4 of different chemotherapy regimens





## Chemotherapy

#### Tips:

Be proactive, not reactive

Concentrate on when appetite is best

Use medication to your advantage (antiemetics/laxatives/antidiarrhoeal agents)

#### Taste changes:

- Try new foods
- Plastic utensils
- Flavour with herbs & spices
- Mouth hygiene
- Boiled sweets/gum
- Rinse mouth before meals
- Cold/frozen foods (expect if on oxaliplatin sensitivity to cold)





## Surgery – Prehabilitation

Optimise nutritional status and physical fitness before surgery & improve recovery

- Diet
- Fitness
- Psychological support

#### **Benefits:**

- Reduced complications
- Reduced length of stay
- Improved fitness/functional levels
- Improved nutritional status
- Quicker recovery
- More likely to tolerate adjuvant chemotherapy
- Behaviour change

#### Aims:

Treat/prevent malnutrition Mitigate metabolic derangements Maintain/improve physical performance/skeletal muscle mass Improve likelihood of receiving treatment Prepare for post-operative dietary needs



### Surgery – post-operative





## Aims of dietetic input

Improve energy & protein intake

Minimise nutritional losses

Preserve physical function

Improve tolerance of treatment

Improve likelihood of receiving treatment

Improve quality of life

Improve outcomes/survival



## **ESPEN** guidelines Cancer 2021

Energy requirements = 25-30kcal/kg/day

Protein requirements = 1-1.5g/kg/day



Fig. 2. General concepts of treatment relevant to all cancer patients: screening and assessment; energy and substrate requirements.

**ESPEN** guidelines 2021



## NICE guidelines [NG85] 2018

Nutritional input to improve Quality of life (QoL) and improve ability to undergo treatment (NICE 2018)

#### **1.6 Nutritional management**

- 1.6.1 Offer enteric-coated pancreatin for people with unresectable pancreatic cancer.
- 1.6.2 Consider enteric-coated pancreatin before and after pancreatic cancer resection.
- 1.6.3 Do not use fish oils as a nutritional intervention to manage weight loss in people with unresectable pancreatic cancer.
- 1.6.4 For people who have had pancreatoduodenectomy and who have a functioning gut, offer early enteral nutrition (including oral and tube feeding) rather than parenteral nutrition.
- 1.6.5 For more guidance on nutrition support, see the <u>NICE guideline on nutrition support in adults</u>.

#### National Institute for Health and Care Excellence

#### Pancreatic cancer in adults: diagnosis and management NICE Guideline NG85 Methods, evidence and recommendations

Final

February 2018

Developed by the National Guideline Alliance, hosted by the Royal College of Obstetricians and Gunaecologists



## Dietary advice

Little and often (small portions help with early satiety)



Food fortification Fortified milk (4tbsp skimmed milk powder/pint whole milk) Add cream, cheese, butter, milk powder, jam, ice cream

Exercise/fresh air to stimulate appetite

PERT – ensure taking correctly

Personalise dietary advice (listen to what the patient likes)



Relax dietary restrictions (e.g. with diabetes) but involve diabetes nurses

Manage expectations – aim for weight maintenance

Focus on QoL!!!







## Oral nutritional supplements (ONS)

May help to improve nutritional status by maintaining body composition +/or increasing fat mass (Kim et al 2019)

• Better results if started at initiation of chemotherapy





## Poll

Should enteral nutrition be used in patients diagnosed with advanced pancreatic cancer?

1. Yes

2. No



## Enteral nutrition

Preferential over parenteral nutrition (NICE guidelines 2018)

Could be used at any point in pathway

Peptide feed first-line

PERT still required

Not enough evidence

Should we be proactive and give to patients undergoing triplet chemotherapy?



## Duodenal stent



Build up with soft/moist diet

Little and often – high kcal/protein

Avoid: Bread Tough meat/gristle Nuts/dried fruit Raw/stringy veg



## Case study

Discussed in gold standard frameworks (GSF) meeting:

63 year old female Body of pancreas – adenocarcinoma Weight 75kg Height: 1.73m No weight loss

Already started FOLFIRINOX (3 cycles) – dose reduction due to diarrhoea



## Poll

#### Would you refer to the dietitian/see this patient (if you are a dietitian)?

1. Yes

- 2. No
- 3. Need more information



### Case study cont.

Weight stable

#### Good appetite

Symptoms: flatus reported. Diarrhoea resolved with chemo dose reduction

Not taking PERT



## Poll

Would you have started PERT at this point?

1. Yes

2. No

3. Need more information



## Ongoing research

REVIEW

Journal of Cachexia, Sarcopenia and Muscle (2022) Published online in Wiley Online Library (wileyonlinelibrary.com) DOI: 10.1002/jcsm.12954

Mapping ongoing nutrition intervention trials in muscle, sarcopenia, and cachexia: a scoping review of future research

Camila E. Orsso<sup>1</sup> , Montserrat Montes-Ibarra<sup>1</sup>, Merran Findlay<sup>2</sup>, Barbara S. van der Meij<sup>3,4,5,6</sup>, Marian A. E. de van der Schueren<sup>5,6</sup>, Francesco Landi<sup>7,8</sup>, Alessandro Laviano<sup>9</sup> & Carla M. Prado<sup>1\*</sup>

**Ongoing trials:** Recommendations for future trials: All populations should be further investigated Most trials in cancer, obesity, metabolic diseases, musculoskeletal conditions, or Efforts must be made towards interventions in: chronic liver disease Population - Older adults with muscle-related conditions Limited number of trials in cachexia or older - Patients with sarcopenic obesity adults with muscle-related conditions - Patients with cachexia Consider having a pragmatic / adaptive design Most trials have a two-arm, parallel design Include multiple arms in multimodal trials Few trials have a pragmatic design Design Double-blinded masking approach for food Heterogeneous masking approaches supplement trials Test the impact of different protein doses and/ or amino acid composition Food supplements and ONS containing protein, Compare the effects of specialized ONS to amino acids, HMB, or omega-3 fatty acids are isocaloric and isonitrogenous ONS common nutrition interventions Test the effects of multi-ingredient and creatine Nutrition Few trials compare different doses of protein supplements intervention across participants Nutritional counselling should be considered to Few trials test multi-ingredient supplements ensure adequate energy and protein intakes Not all trials offer dietary advice Consider approaches to improve patient Length of intervention: 5 days to 24 months adherence Interventions of sufficient time for adequate muscle response Opportunistic use of set timelines between CT Most studies evaluate muscle mass by BIA or scans obtained as part of medical care for DXA muscle mass and radiodensity measures Trials in patients with cancer, and chronic liver Anthropometry can be used as an exploratory disease use CT scans for muscle mass outcome, but not as a primary outcome quantification; however, muscle radiodensity is Assess muscle function using lower body often not evaluated Outcome strength, gait speed, SPPB, and TUG test Most studies assess muscle strength by assessment Include outcomes related to quality of life handgrip strength test Consider cost-effectiveness analysis A considerable number of studies uses lower Collect and report measures of patient body strength measures adherence to prescribed interventions Physical performance is assessed mainly by Avoid multiple primary outcomes of interest gait speed test and SPPB Use independent, blinded researchers to Few studies describe a post-intervention followassess trials outcomes up assessment Consider evaluating sustained effects of interventions Improve study information in trial registries Insufficient reporting of study characteristics Trial prior to trial initiation in many trials registration Update study information as needed or when Lack of updates study status is changed

Figure 7 Recommendations for future trials investigating nutrition or multimodal interventions to prevent or treat low muscle mass or function, sarcopenia, or cachexia. BIA, bioelectrical impedance analysis; CT, computed tomography; DXA, dual-energy X-ray absorptiometry; ONS, oral nutritional supplement; SPPB, Short Physical Performance Battery; TUG, timed up and go.



## Take away messages

Dietetic input for all patients diagnosed with pancreatic cancer

Early dietetic input is key

Focus on QoL!

Manage expectations

Teamwork

Monitor for fat-soluble vitamin deficiencies