Malnutrition in the oncology setting: prevalence, diagnosis and treatment strategies

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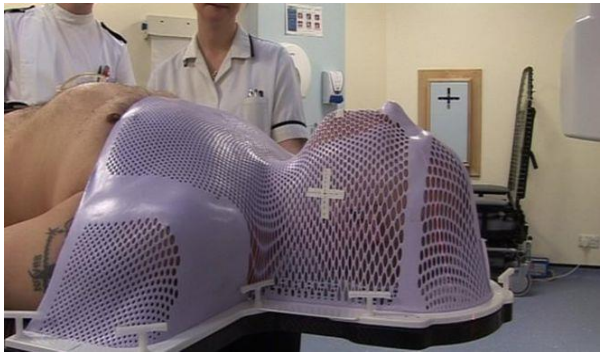
Overview

1. Background of cancer-related malnutrition
2. Forms of cancer-related malnutrition
3. Original research
   - Prevalence of malnutrition in an Irish oncology population
   - Detection of malnutrition and abnormal body composition phenotypes
4. Treatment strategies
   - ‘Good Nutrition for Cancer Recovery’ initiative
5. Conclusion

Background

- Malnutrition is highly prevalent in the oncology setting
  - International data: 8-85% cancer patients (Bozetti, 2009; Martin et al., 2015; Kruizenga et al., 2016)
  - Prevalence of malnutrition in Irish oncology patients is currently unknown
- Malnutrition in the oncology setting is multifactorial (Argiles et al., 2015)



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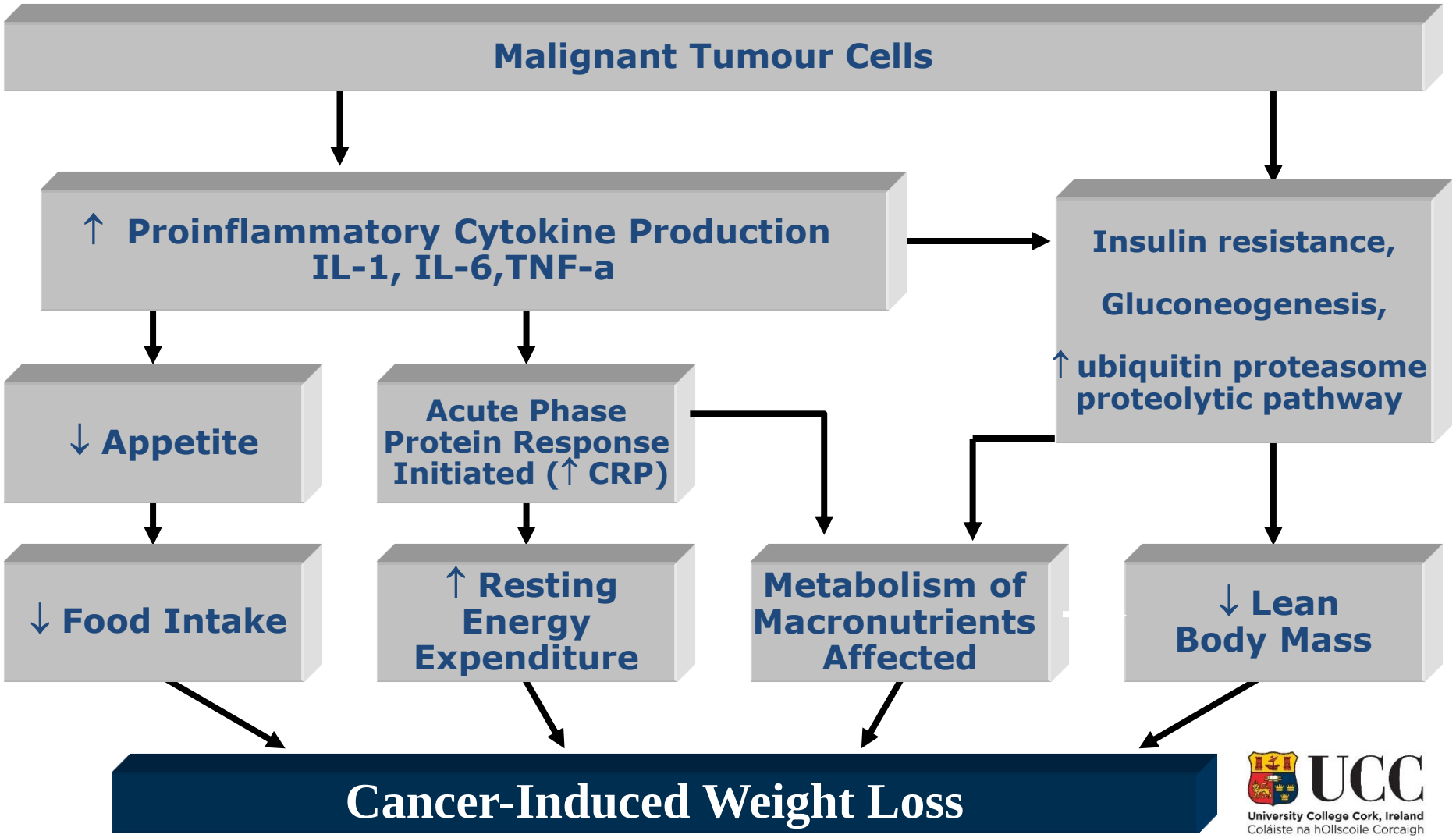
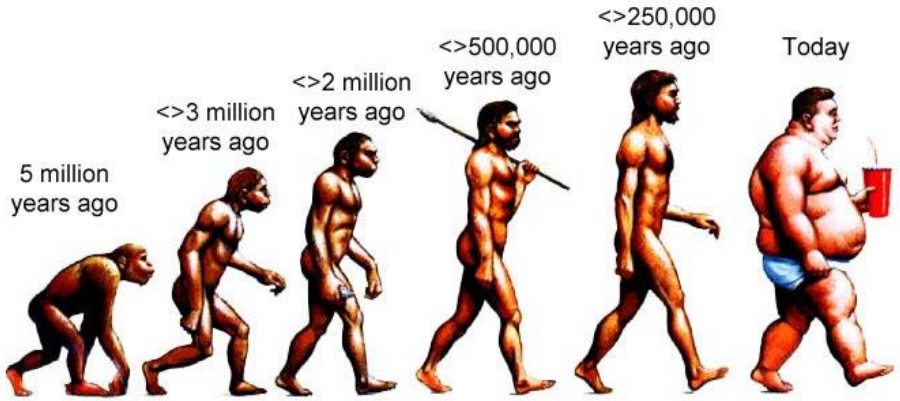


Background

- Rates of overweight and obesity increasing
- Detection of malnutrition is challenging
- Encompasses a range of abnormal body composition phenotypes:
  - Cancer-associated weight loss
  - Pre-cachexia
  - Cancer cachexia
  - Sarcopenia
  - Myosteatosis



Background

- **Cancer cachexia** (Fearon et al, 2011)

A multifactorial syndrome defined by an ongoing loss of skeletal muscle mass (with or without loss of fat mass) that cannot be fully reversed by conventional nutritional support and leads to progressive functional impairment

a) Weight loss >5% over past 6 months (in absence of simple starvation)

or

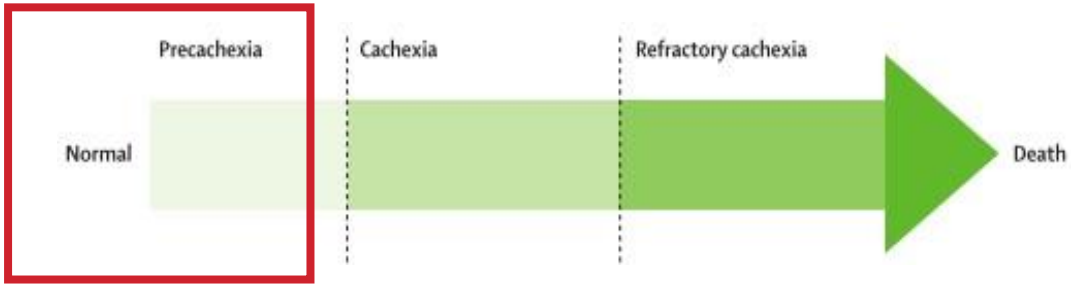
b) BMI <20 kg/m^2 and any degree of weight loss >2%

or

c) Appendicular skeletal muscle index consistent with sarcopenia (men <55 cm^2/m^2; women <39 cm^2/m) and any degree of weight loss >2%

- Prevalence: 60-80% (Fearon 2011, Von Haeling 2010)

Background



- **Pre-cachexia** (Muscaritoli et al., 2010)

a) underlying chronic disease

b) unintentional weight loss <5% of usual body weight during the last 6 months

c) chronic or recurrent systemic inflammatory response

d) anorexia or anorexia-related symptoms

Background

Background

- **Sarcopenia-** an appendicular skeletal muscle mass >2 SD below the mean of a healthy reference population (Baumgartner et al., 1998)

	SMI (cm^2/m^2)†	
BMI Category (kg/m^2)	Men	Women
Underweight (< 20.0)	< 43	< 41
Normal weight (20.0 to 24.9)	< 43	< 41
Overweight (25.0 to 29.9)	< 53	< 41
Obese (≥ 30.0)	< 53	< 41

- Prevalence: 24.2-68% (Sandidi 2016, Fukushima 2016)

- **Myosteatosis-** Low muscle radiation attenuation, reflecting a higher lipid content in muscle and poorer quality muscle

	Skeletal MA (HU)‡	
BMI Category (kg/m^2)	Men	Women
Underweight (< 20.0)	< 41	< 41
Normal weight (20.0 to 24.9)	< 41	< 41
Overweight (25.0 to 29.9)	< 33	< 33
Obese (≥ 30.0)	< 33	< 33

- Prevalence: 41-60% (Chu 2015, Rier 2017)

Martin et al., 2013

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Why is this important?

Sarcopenia as a predictor of dose limiting toxicity (DLT)

- Fluorophyamidine & oxaliplatin/irrinotecan in metastatic colorectal cancer (Barret et al, 2014)
- Cisplatin/5-FU or Eipribicin & cisplatin and capecitabine in oesophago-gastric cancer (Tan et al, 2015)
- Epirubicin in breast cancer (Prado et al., 2011)
- Capecitabine metastatic breast cancer (Prado et al., 2009)
- 5-FU Colorectal cancer (Prado et al., 2007)
- Sorafenib in Renal cell cancer (Antoun et al., 2010; Mir et al., 2012)
- Sunitinub in metastatic renal cell cancer (Cushen et al., 2015; Huillart et al., 2013)
- Vandetanib in thyroid cancer (Massicotte et al., 2013)
- Doxil in ovarian cancer (Prado et al., 2014)
- Taxane-based chemotherapy in metastatic breast (Paclitaxel, Docetaxel, Nab-paclitaxel) (Shachar et al., 2016)
- Imatinib in gastrointestinal stromal tumours (Moryoussef et al., 2015)
- Ipilimumab in metastatic melanoma (Daly et al., 2017)

Nutritional status as a predictor of quality of life

Role of nutritional status in predicting quality of life outcomes in cancer – a systematic review of the epidemiological literature

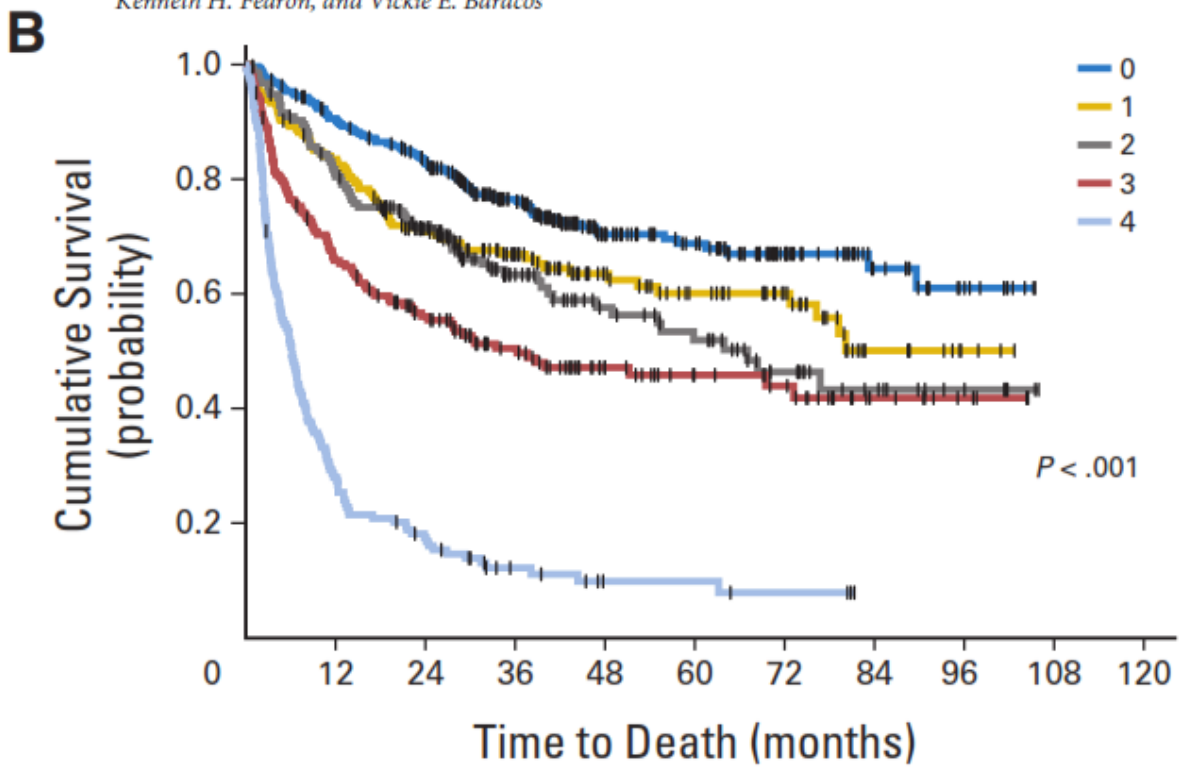
Christopher G Lis, Digant Gupta*, Carolyn A Lammersfeld, Maurie Markman and Pankaj G Vashi

- 26 studies: 5,560 cancer patients
- 24/26 studies concluded that better nutritional status was associated with better Quality of life

Weight loss as a predictor of survival

Diagnostic Criteria for the Classification of Cancer-Associated Weight Loss

Lisa Martin, Pierre Senesse, Ioannis Gioulbasanis, Sami Antoun, Federico Bozzetti, Chris Deans, Florian Strasser, Lene Thoresen, R. Thomas Jagoe, Martin Chasen, Kent Lundholm, Ingvar Bosaeus, Kenneth H. Fearon, and Vickie E. Baracos



Martin et al, JCO, 2015

Loss of ability to maintain weight (even weight loss of 2.4%) is significantly related to reduced survival

Identification of Malnutrition

- CT: Cost, time and staffing constraints
- Inadequate screening protocols in place to detect this malnutrition
- National audit (Health Information and Quality Authority, 2016)
  - 20% of hospitals have no screening protocol
  - 50% adhere to recommendations of screening at risk patients on 75% of wards within 24 hours of admission
- HIQA to mandate screening
- ESPEN strongly recommend routine screening of patients
- ? What tool is most appropriate for oncology setting

Research questions

1. What is the prevalence in Irish oncology patients?

2. How can we detect it?

Methods

- Cross sectional study
- Ambulatory oncology outpatients presenting for chemotherapy
- 2012 – 2015 at two university teaching hospitals.

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- Researcher assisted patient questionnaire and detailed chart review obtaining:
  - Clinical data
  - Biochemical results
  - Nutritional assessment →
  - Quality of life data →

- Malnutrition Universal Screening Tool (**MUST**)
- Malnutrition Screening Tool (**MST**)
- Nutritional Risk Index (**NRI**)

- **Cancer cachexia** consensus definition (Fearon et al, 2011)
- Computed tomography (CT) assessment of muscle to define **sarcopenia** & **myosteatosis** according to international criteria (Martin et al, 2013)

EORTC QLQ-C30 (version 3)

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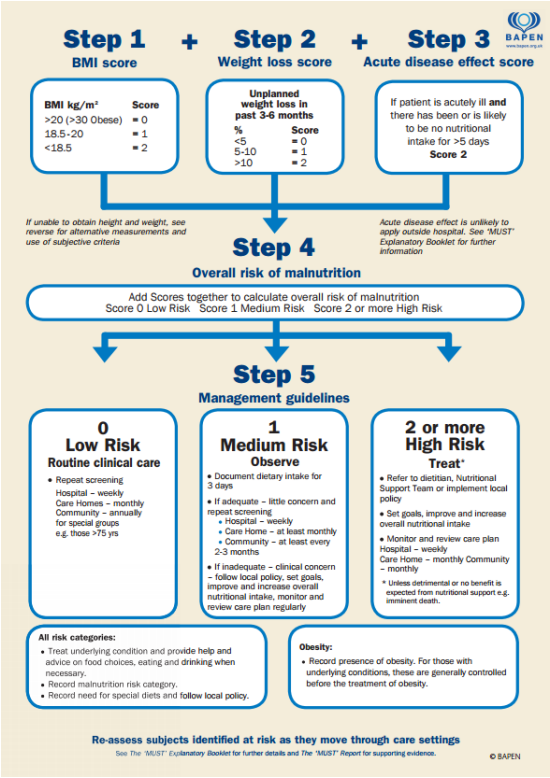
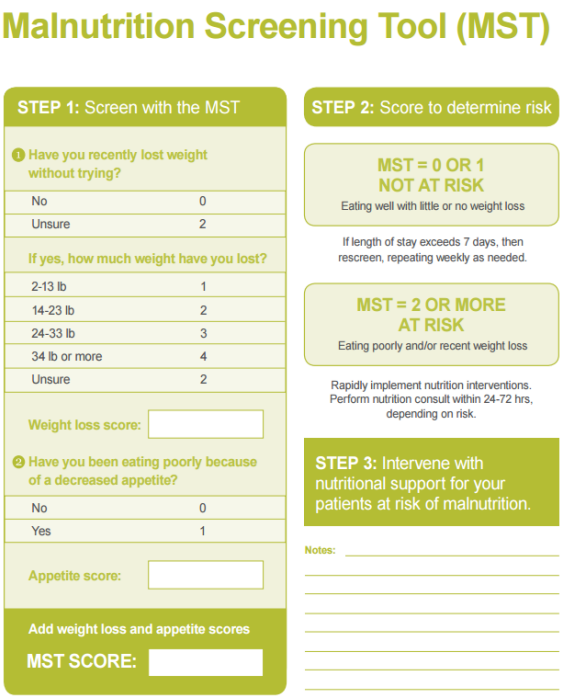
Methods





Nutrition Risk Index (NRI)

1.519 (serum albumin; g/dL)
+ 41.7 (current weight/usual weight)

NRI >100 = not malnourished
NRI 97.5-100 = mild malnourishment
NRI 83.5-97.5 = moderate malnourishment
NRI <83.5 = severe malnourishment

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Research question

How do we address cancer-related malnutrition?

"Cachexia has perhaps suffered more from selective neglect & therapeutic nihilism than any other symptom requiring palliative care"

Del Fabbro, JAMA, 2007

"Unfortunately, there's no cure—there's not even a race for a cure."

Background

- Anabolic potential
- Timely nutrition intervention critical
- Not driven by simple starvation
- Multimodal intervention:

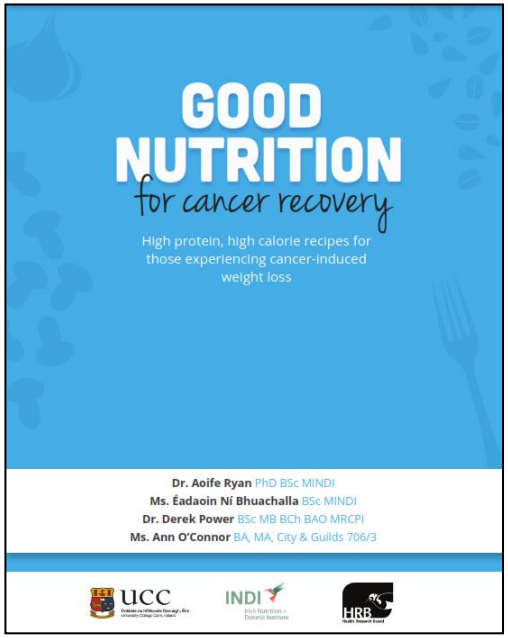
1. **Provision of adequate energy and protein**
2. **Down-regulation of inflammation**
3. **Physical activity**

Background

- Major source of anxiety for patients and carers
- Patients actively seek nutritional information
  - 60% patients frequently used the internet to search for information (van de Poll-Franse and Eenbergen, 2008)
- Misinformation and dangerous ‘fad’ diets widespread
- Food first approach recommended as initial intervention by ESPEN (Arends et al., 2016)
- Staffing limitations: 1 oncology dietitian per >1 300 cancer patients
- Need for a safe, evidence based resource

Nutritional Resource

- 130 page high-protein, high-calorie cookbook for cancer-induced weight loss
- 53 recipes
  - soups
  - light meals
  - main meals
  - desserts
  - nourishing drinks
- **19,000 copies available free of charge**
- Endorsed by:



INDI Irish Nutrition + Dietetic Institute

irspen Irish Society for Clinical Nutrition & Metabolism

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Soups

- Nutritional targets:
  - >300 kcals per serving
  - >3g protein per serving
- Energy range: 281-542 kcals per portion
- Protein range: 4.8-22.5 g per portion

Light Meals

- Nutritional targets
  - Min. of 500kcal (with a target of >800 kcals) per portion
  - Min. of 15g protein (with a target of >23g protein) per portion
- Energy range: 519-873 kcals per portion (226-231 kcal per slice for breads)
- Protein range: 15-36 g per portion (8.5-9.1 g per slice for breads)

Main Meals

- Nutritional targets
  - Min. of 500kcal (with a target of >800 kcals) per portion
  - Min. of 15g protein (with a target of >23g protein) per portion
- Energy range: 501-913 kcals per portion
- Protein range: 15.0-42.7 g per portion

Smoothies

- Nutritional targets
  - >300 kcals per serving
  - >3g protein per serving
- Energy range: 301-556 kcals per portion
- Protein range: 4.7-15.8 g per portion





Desserts & Snacks

- Nutritional targets
  - >300 kcals per serving
  - >5g protein per serving
- Energy range: 304-1223 kcals per portion
- Protein range: 4.3-22.9 g per portion

Outreach programme

- Distributed to **74 locations** in Ireland & UK
- Cookery demonstration for cancer patients
- >22 media interviews (print, radio & TV)
- Oral presentations to HCPs
  - Irish Nutrition and Dietetic Institute
  - Irish Society of Medical Oncology

Testimonials

- Recipient of an Irish Healthcare Award in 2015
- Positive feedback

"Congratulations on this great resource and thank you for all your hard work in creating it. I only wish that we had more of these resources which offer a 'food first' approach to treating disease-based malnutrition'

Sharon Kennelly, BSc PhD Clinical Specialist Dietitian, Service Improvement Programme, HSE

"When I was diagnosed with cancer I lost almost 2 stone in just a few months. Since following the advice in this cookbook I have regained almost half a stone and my energy levels have improved immensely. I am so grateful to have this wonderful, easy to use resource"

Gastric cancer patient, undergoing treatment in Cork.

"This is a truly excellent and practical resource for cancer patients and their carers"

Cara Cunnimgham, Community Dietitian

"Great initiative to provide professional and trustworthy dietary guidance for cancer patients"

Dr Robert O'Connor, Head of Research, Irish Cancer Society

"Eadaoin & Aoife & team, impressive as always, what a fantastic free resource for cancer patients.

Ms Jennifer Feighan, CEO, INDI

"Finally! An evidence based recipe book for eating well with cancer written by dietitians. Badly needed and so valuable for cancer patients and HCP alike"

Freelance Dietitians of Ireland

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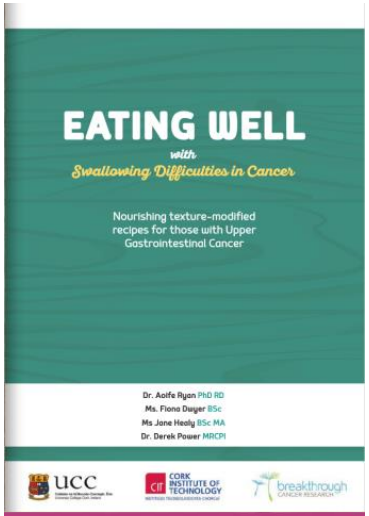
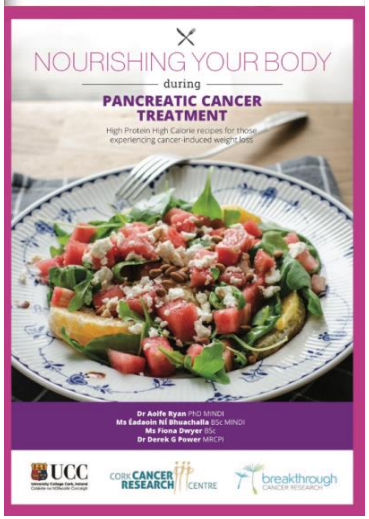
Ongoing work

- Eating well with swallowing difficulties- released in 2016
- Pancreatic Action UK
    - Nourishing your body during pancreatic cancer treatment
        - UK: January 2017
        - Ireland: April 2017
- Health Service Executive- to roll out resource as part of food first initiative





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Nutritional Intervention

The need for a "parallel pathway"

1. Oral Intake
2. Systemic inflammation
3. Exercise

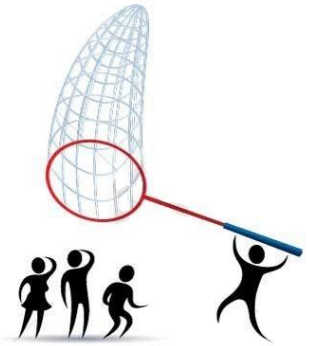
The MENAC Trial

The MENAC Trial

(Multi-modal Exercise, Nutrition, Anti-inflammatories to prevent Cachexia)

- International: Sweden, Norway, Denmark, Switzerland, Canada, UK & **Ireland**
- Pancreatic & Lung cancer on chemo
- RCT: 6 week intervention
  - NSAIDS
  - Exercise
  - Dietary advice and oral nutritional supplement with omega-3
- Body composition by CT

Conclusions



- Malnutrition is highly prevalent in Irish cancer patients
- High rate of adiposity
- Vast misclassification of patients with cancer-related malnutrition
- ? Tools placing too much importance on BMI in scoring systems
- NRI: Highly sensitive, poor specificity, independent predictor of survival
- Comprehensive early detection essential: need to consider screening in ambulatory setting
- Timely implementation of tailored, multimodal nutritional interventions required
- Meeting energy and protein requirements key component
- 101 additional oncology dietitians currently required

Acknowledgements

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breakthrough CANCER RESEARCH

HRB Health Research Board

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Mercy University Hospital

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Thank You!