THAI KHAC MINH

A/ PROF., M.D., Ph.D.

HCMC University of Medicine and Pharmacy

Vietnam

VIETNAM - FRANCE - ASIA - PACIFIC
CONFERENCE ON OBSTETRICS AND GYNECOLOGY
Ho Chi Minh City, May 19th - 20th, 2016

16th

HỘI NGHỊ SẢN PHỤ KHOA
VIỆT - PHÁP - CHÂU Á - THÁI BÌNH DƯƠNG
LẦN THỨ 16
TP. Hồ Chí Minh, ngày 19 & 20/5/2016

NUTRITIONAL INTERVENTIONS FOR CANCER-INDUCED CACHEXIA

Dr Pharm **Khac-Minh Thai**
thaikhacminh@gmail.com

Department of Medicinal Chemistry
University of Medicine and Pharmacy, Ho Chi Minh City

Clinical Guidelines

aspen LEADING THE SCIENCE AND PRACTICE OF CLINICAL NUTRITION
American Society for Parenteral and Enteral Nutrition

Journal of Parenteral and Enteral Nutrition
Volume 40 Number 2
February 2016 159–211

DOI: 10.1177/0148607115621863
jpen.sagepub.com
hosted at
online.sagepub.com
SAGE

Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Adult Critically Ill Patient: Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.)

Stephen A. McClave, MD[1*]; Beth E. Taylor, RD, DCN[2*]; Robert G. Martindale, MD, PhD[3]; Malissa M. Warren, RD[4]; Debbie R. Johnson, RN, MS[5]; Carol Braunschweig, RD, PhD[6]; Mary S. McCarthy, RN, PhD[7]; Evangelia Davanos, PharmD[8]; Todd W. Rice, MD, MSc[9]; Gail A. Cresci, RD, PhD[10]; Jane M. Gervasio, PharmD[11]; Gordon S. Sacks, PharmD[12]; Pamela R. Roberts, MD[13]; Charlene Compher, RD, PhD[14]; and the Society of Critical Care Medicine[†] and the American Society for Parenteral and Enteral Nutrition[†]

Preferred route of feeding

Healthy meal

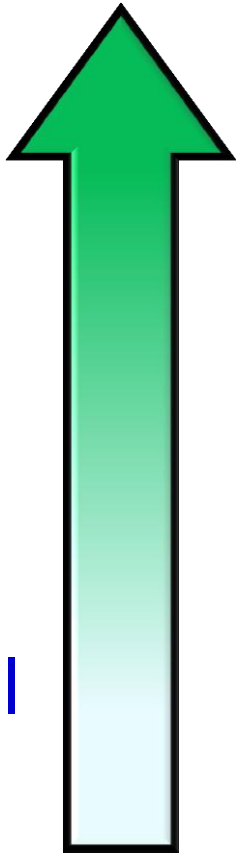
Oral

Enteral gastric

Enteral duodenal/jejunal

Small amount Enteral rest Parenteral

Total parenteral



Overview

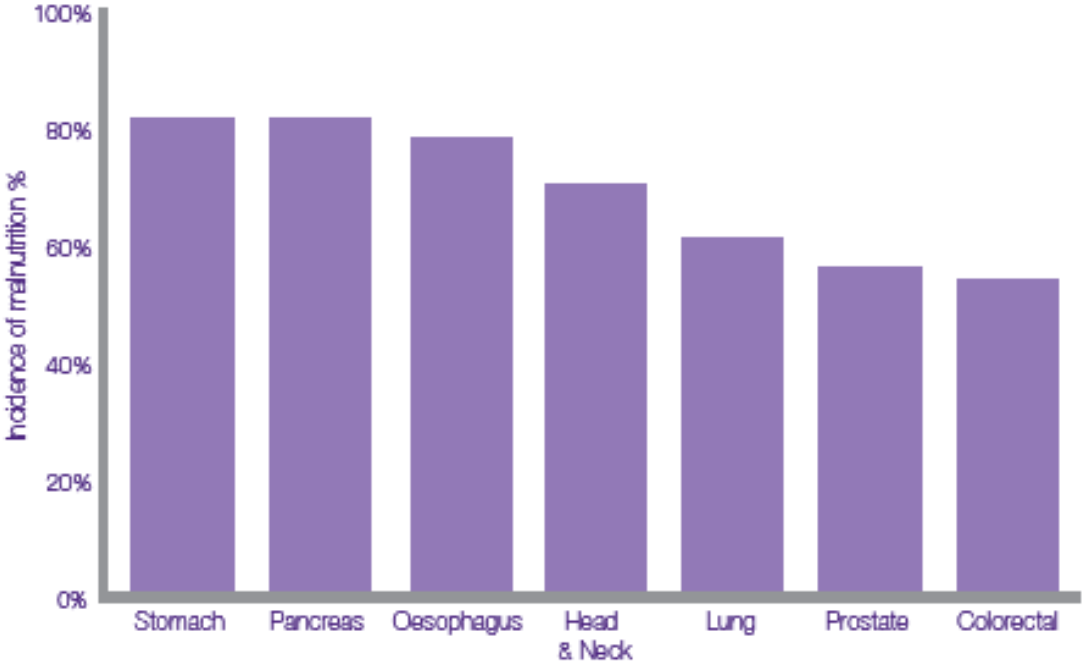
- Weight loss to cancer-induced cachexia
- Specific nutrition for cancer patients - Nutrition in Cancer Care
- Summary

Overview

- **Weight loss to cancer-induced cachexia**
- **Specific nutrition for cancer patients - Nutrition in Cancer Care**
- **Summary**

Prevalence of Weight loss in Cancer

- **30-85% dependent on:**
- Tumor (type & stage)
- Treatment
- Age
- Individual susceptibility
- Method of assessment



During the course of the disease there is weight loss of >10% in up to 45% of patients

Bozzetti 2008 and 2001; Bosaeus 2001
Laviano A, Meguid MM. Nutrition 1996;12:358-71

Prevalence of Weight loss in Cancer

30-85% dependent on:

- **Tumor (type & stage)**
- **Treatment**
- **Age**
- **Individual susceptibility**
- **Method of assessment**

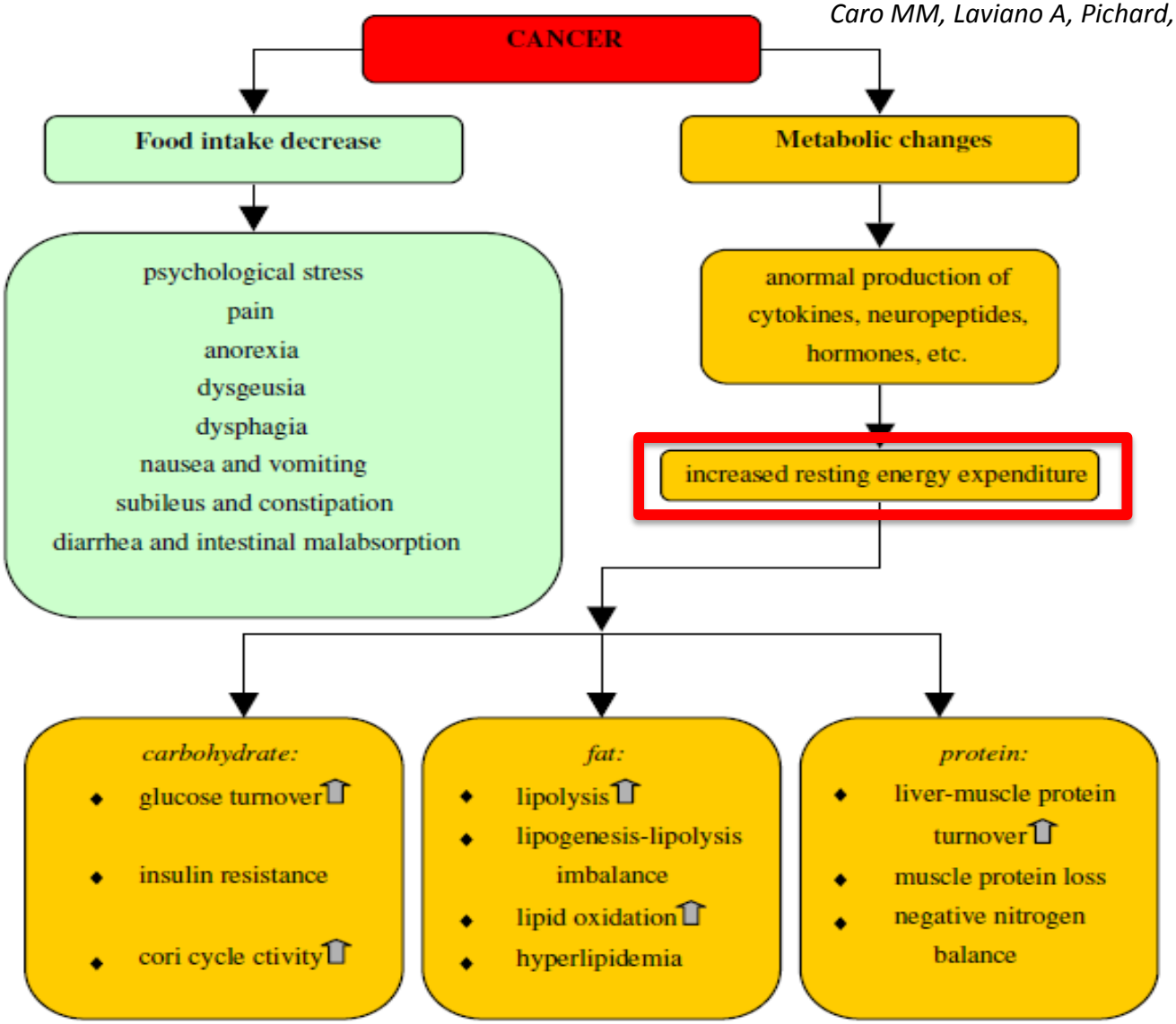
Over 20 % of death are due simply to malnutrition and host tissue wasting

50% of newly diagnosed cancer patients are anorexic

Nutrition; 12: 358-371, 1996

Weight loss in cancer patients

Caro MM, Laviano A, Pichard, Clin Nutr 2007

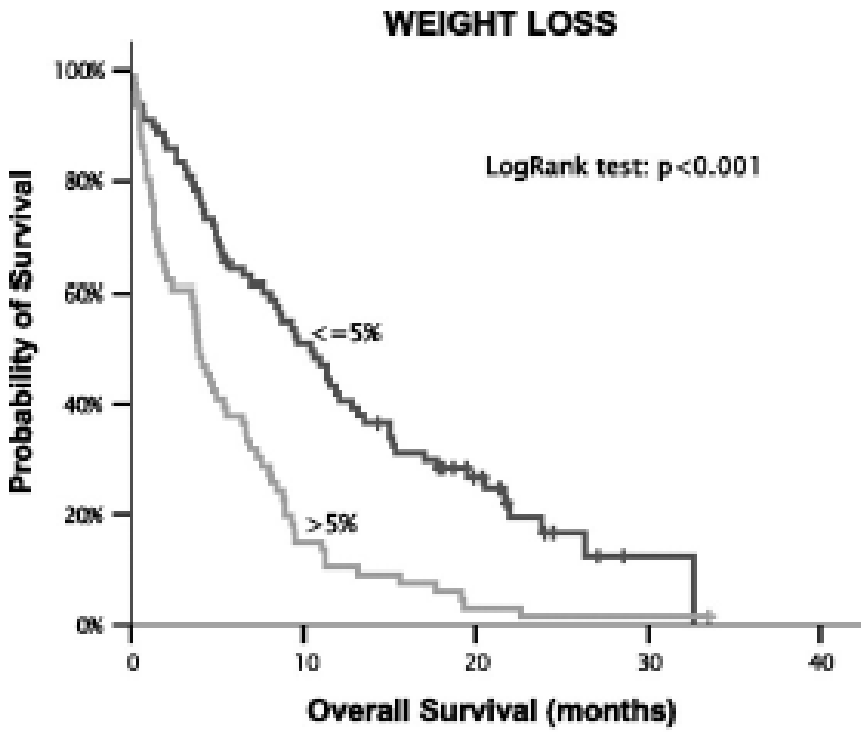


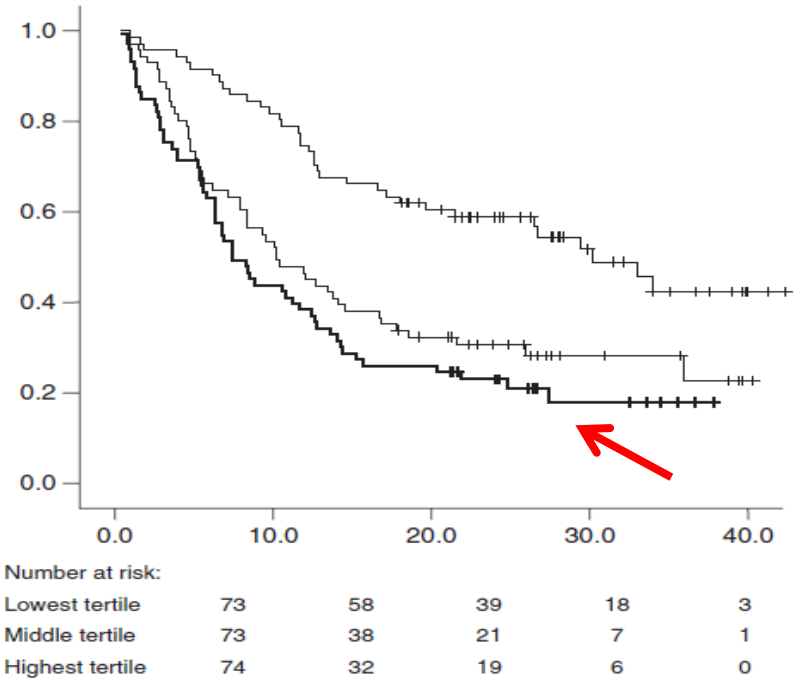
The higher rate of weight loss: the less survival

original article

Annals of Oncology 22: 835–841, 2011
doi:10.1093/annonc/mdq440
Published online 11 October 2010

Baseline nutritional evaluation in metastatic lung cancer patients: Mini Nutritional Assessment versus weight loss history





Number at risk:

Lowest tertile	73	58	39	18	3
Middle tertile	73	38	21	7	1
Highest tertile	74	32	19	6	0

Figure 1 Survival curve representing survival duration in the patient cohort from time of diagnosis stratified according to tertiles of rate of weight loss. Thin line = lowest rate of weight-loss tertile with a median survival of 30.2 months; middle line = middle rate of weight-loss tertile with a median survival of 10.2 months; thick line = highest rate of weight-loss tertile with a median survival of 7.5 months ($P < 0.0001$, log-rank test).

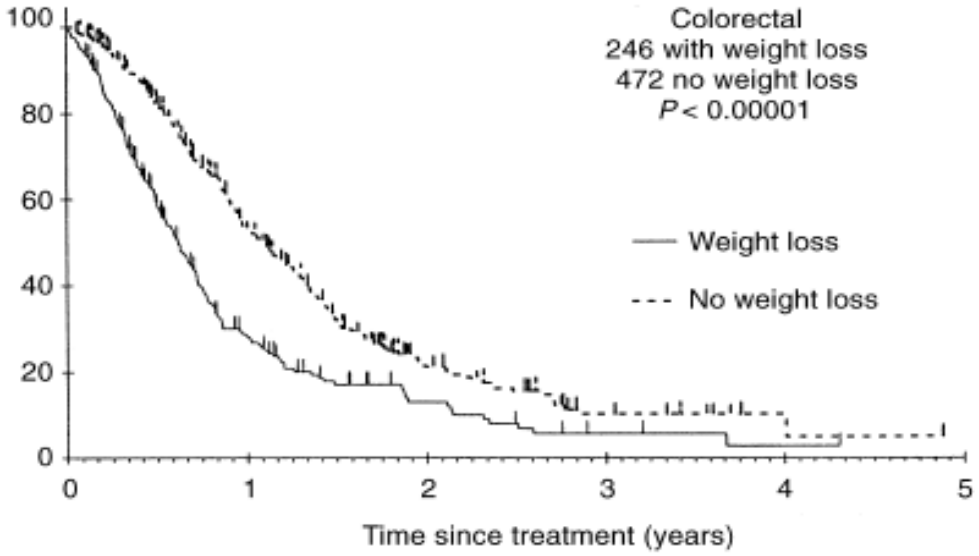
Ann Oncol. 2011, 22(4):835-41.

Weight change before presentation is associated with poorer outcomes in GI cancer

	51% weight stable	49% weight loss	
QoL score (0-100)	76	59	p<0.0001
Stomatitis 1-4	39 %	52 %	p<0.0001
Treatment duration	150 d	120 d	p<0.0001
Response rate	higher	lower	p=0.006
Overall survival	11.9 m	7.6 m	p<0.0001

N=1555,

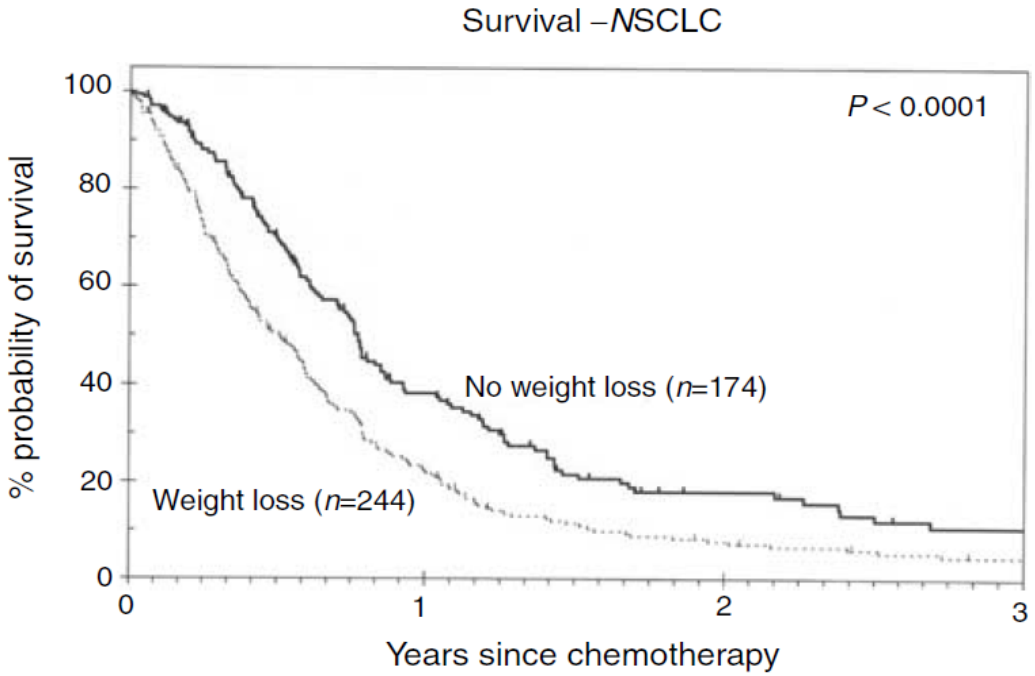
(Age 18-84 y)



Andreyev, Eur J Cancer 1998

Weight loss is an independent PROGNOSTIC factor for survival in NSCLC

Do patients with weight loss have a worse outcome when undergoing chemotherapy for lung cancers?



Patients with weight loss and NSCLC (p=0.003) more frequently failed to complete at least three cycles of chemotherapy

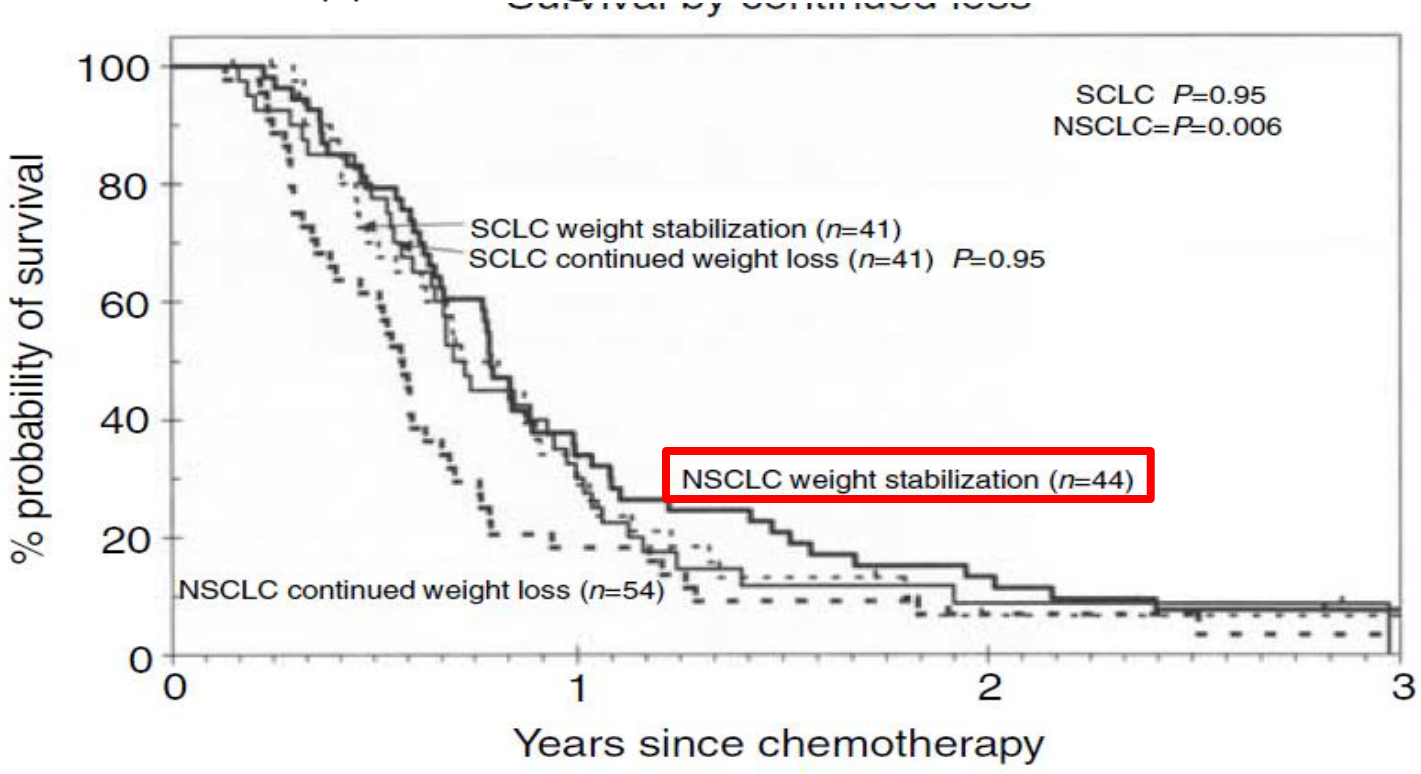
Prospectively collected data, stage III/IV NSCLC

British Journal of Cancer (2004) 90, 1905 – 1911

www.bjcancer.com

Weight stabilization during chemotherapy contributes to higher survival

Do patients with weight loss have a worse outcome when undergoing chemotherapy for lung cancers?

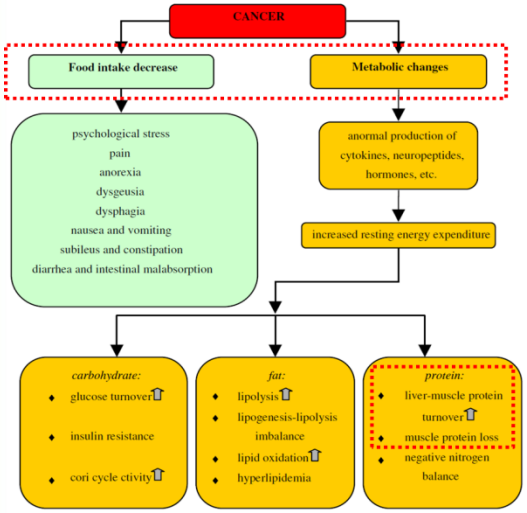


Prospectively collected data, stage III/IV NSCLC

British Journal of Cancer (2004) 90, 1905 – 1911

www.bjcancer.com

Standard chemotherapy & other cancer treatments reinforce cancer weight loss



+

Carmustine
Carboplatin
Cisplatin
5-Fluoruracil
Doxorubicin
Paclitaxel
…
Sorafinib
Everolimus
…
Radiation
Surgery

Weight loss at the start of treatment is associated with reduced response rates and increased toxicity and is included as one of the key Common Terminology criteria of Adverse events (CTCAE)

US Dept Health and Human services NIH, NCI: CTCAE v4.0

Prevalence of Side Effects of cancer treatments

Treatment	Weight Loss	Fatigue	Nausea/ Vomiting	Oral Mucositis	Taste Alterations	Constipation
Overall %	50%-90%	70%-100%	30%-90%	40%-100%	35%-70%	40%-50%
Chemotherapy	✓	✓	✓	✓	✓	✓
Radiation	✓	✓	✓	✓	✓	
Surgery	✓	✓	✓			
Immunotherapy	✓	✓		✓		

✓ = treatment in which side effect is common

Cancer Cachexia

Definition and classification of cancer cachexia: an international consensus

Kenneth Fearon, Florian Strasser*, Stefan D Anker, Ingvar Bosaeus, Eduardo Bruera, Robin L Fainsinger, Aminah Jatoi, Charles Loprinzi, Neil MacDonald, Giovanni Mantovani, Mellar Davis, Maurizio Muscaritoli, Faith Ottery, Lukas Radbruch, Paula Ravasco, Declan Walsh, Andrew Wilcock, Stein Kaasa, Vickie E Baracos*

THE LANCET Oncology

Consensus findings

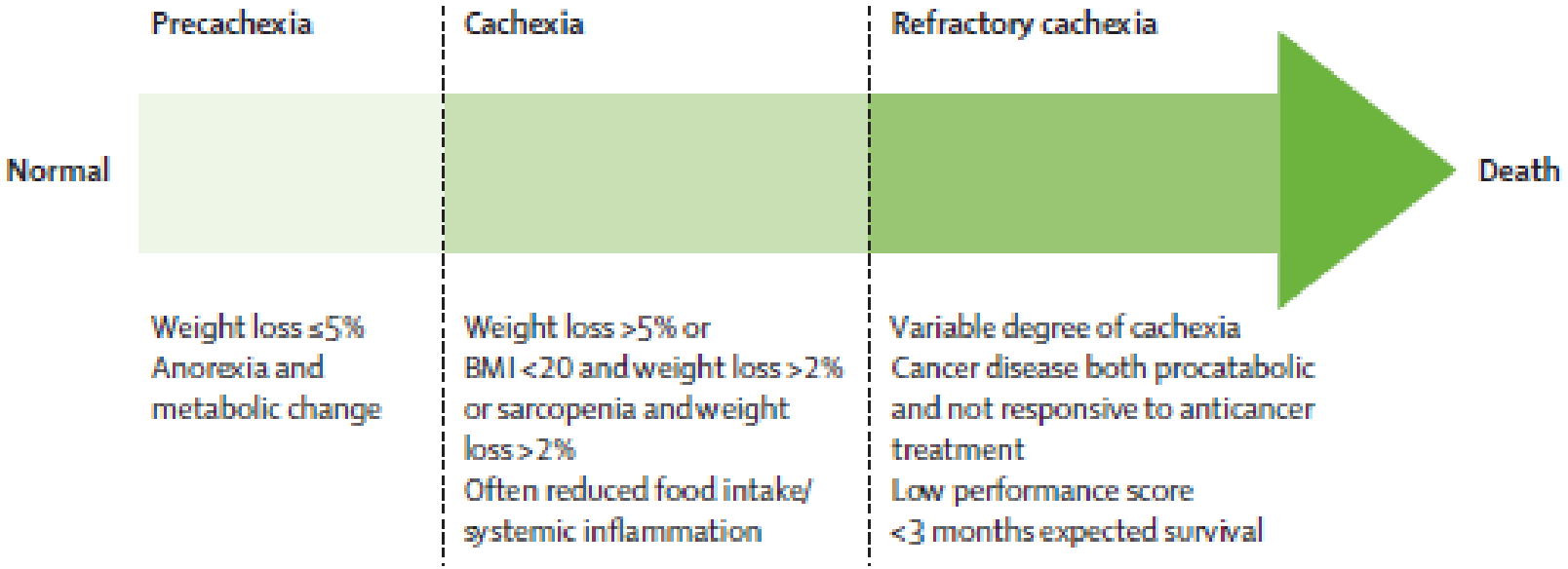
Definition and diagnosis

Cancer cachexia is defined as a multifactorial syndrome characterised 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. The pathophysiology is characterised by a negative protein and energy balance driven by a variable combination of reduced food intake and abnormal metabolism. Consensus statements for diagnosis are presented in the panel.

Fearon K et al. Lancet Oncol 2011; 12:489-495

International consensus group: classification of cancer cachexia in relation to outcomes

THE LANCET Oncology



Recommendation for early recognition of cachexia

Panel: **Diagnosis of cancer cachexia**

- Weight loss >5% over past 6 months (in absence of simple starvation); or
- BMI <20 and any degree of weight loss >2%; or
- Appendicular skeletal muscle index consistent with sarcopenia (males <7·26 kg/m²; females <5·45 kg/m²)* and any degree of weight loss >2%†

Fearon KCH. Eur J Cancer, 2008 & Fearon et al, Lancet Oncol 2011

Aopro et al, position paper of an ESO taskforce, 2014: Ann Oncol 25:

Cancer Cachexia

Assessment

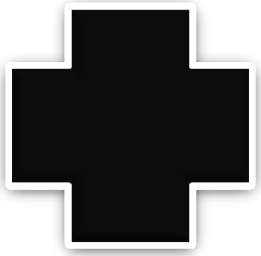
THE LANCET Oncology

Standard Parameters

Weight loss ≥ 5%

over past 12 months

(or BMI<20kg/m^2)



3/5 Parameters

↓ muscle strength

Tired

Anorexic

Clean mass index low

Biochemical tests

High Inflammatory indicator (CRP, IL-6)

Anemia (Hb <12g /dL)

Low Albumin/blood (<3.2 g / dL)

Nutrition in Cancer Care

aspen
Clinical Guidelines

A.S.P.E.N. Clinical Guidelines: Nutrition Support Therapy During Adult Anticancer Treatment and in Hematopoietic Cell Transplantation

ESPEN GUIDELINES

ESPEN Guidelines on Enteral Nutrition: Non-surgical oncology ☆

Clinical Nutrition 28 (2009) 445–454

Contents lists available at ScienceDirect

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

ESPEN Guidelines on Parenteral Nutrition: Non-surgical oncology

Nutritional Interventions

Major goals of supportive nutrition

- Adjunctive to the specific oncology treatment goal
- maintain adequate nutritional status, body composition, performance status, immune function, and quality of life
- Stabilize or improve nutritional status as well as increasing the potential of a favorable response to therapy and enhancing recovery from any adverse effect of therapy
- early supportive nutritional intervention is to avoid irreversible nutritional and physiological deficits
- Weight loss in the cancer patient can often be prevented , but generally only of addressed proactively

Nutrition in Cancer Care

ESPEN Guideline 2006- 2009; ASPEN Guideline 2009

Appropriate nutritional method	• Oral nutrition support (ONS) • Tube feeding • Parenteral nutrition (PN)
Adequate nutrition	• E: 25-30kcal/ kg/day • Protein: 1,2-1,5g/ kg/ day (max 2g) • 50% Energy not from protein
Supplements - Medicine	• Omega 3 • Drugs (steroids, progesterone, Cannabinoids, NSAIDS)

aspen Clinical Guidelines

A.S.P.E.N. Clinical Guidelines: Nutrition Support Therapy During Adult Anticancer Treatment and in Hematopoietic Cell Transplantation

ESPEN GUIDELINES

ESPEN Guidelines on Enteral Nutrition: Non-surgical oncology ☆

Nutrition in Cancer Care

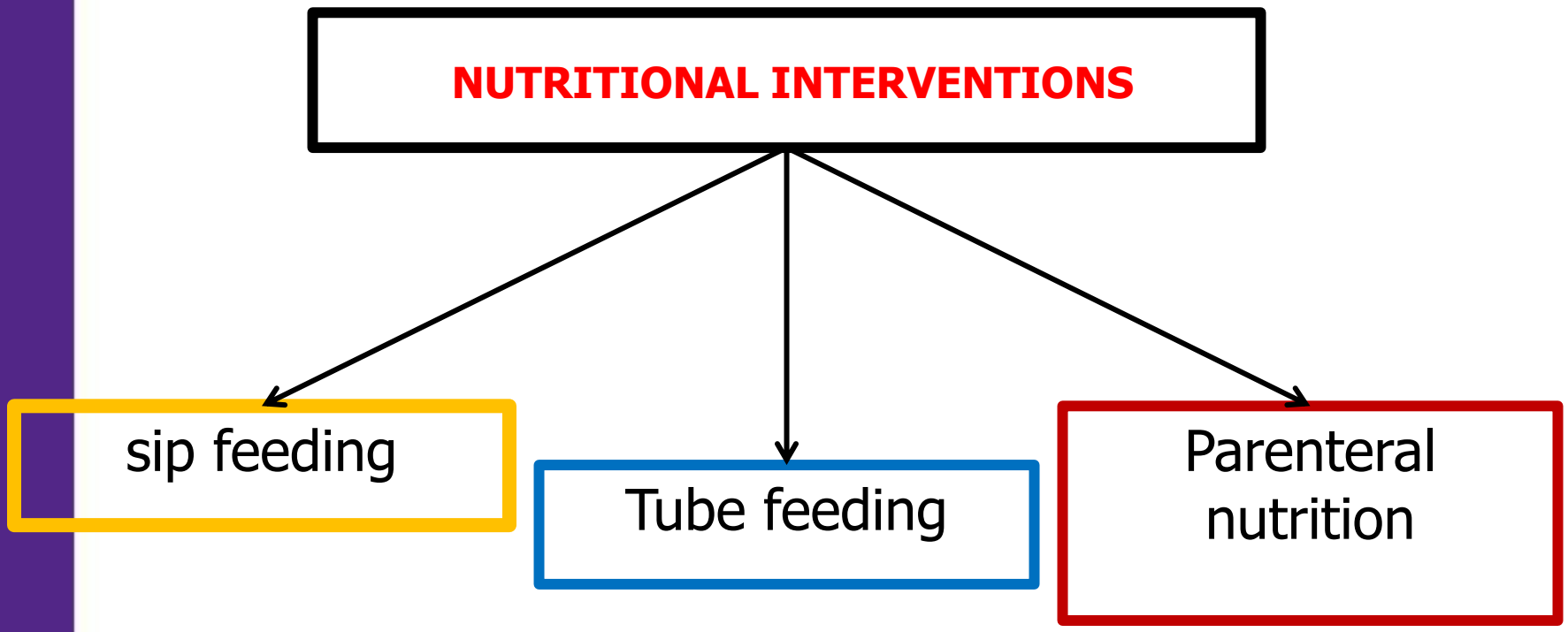
ESPEN Guideline 2006- 2009; ASPEN Guideline 2009

aspen Clinical Guidelines

A.S.P.E.N. Clinical Guidelines: Nutrition Support Therapy During Adult Anticancer Treatment and in Hematopoietic Cell Transplantation

ESPEN GUIDELINES

ESPEN Guidelines on Enteral Nutrition: Non-surgical oncology ☆



Nutrition in Cancer Care

ESPEN Guideline 2006- 2009; ASPEN Guideline 2009

3.2. Is there an indication for EN during radio-therapy or combined radio-chemotherapy?

Yes. Use intensive dietary counselling and ONS to increase dietary intake (A) and to prevent therapy-associated weight loss and interruption of radiation therapy in patients undergoing radiotherapy of gastrointestinal or head and neck areas (A). If an obstructing head and neck or oesophageal cancer interferes with swallow-ing, EN should be delivered by tube (C). TF is also suggested if severe local mucositis is expected, which might interfere with swallowing, e.g. in intensive radiotherapy or in combined modality radio-chemotherapy regimens including radiation of throat or esophagus (C).

aspen Clinical Guidelines

A.S.P.E.N. Clinical Guidelines: Nutrition Support Therapy During Adult Anticancer Treatment and in Hematopoietic Cell Transplantation

Chọn phương pháp dinh dưỡng

ESPEN Guideline 2006- 2009; ASPEN Guideline 2009

Clinical Nutrition 28 (2009) 445–454

Contents lists available at ScienceDirect

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

ESPEN Guidelines on Parenteral Nutrition: Non-surgical oncology

Nutritional support should be started if patient is undernourished or if it is anticipated that the patient will be unable to eat for more than seven days. It should also be started if an inadequate food intake (<60% of estimated energy expenditure) is anticipated for more than 10 days (Grade C). In such cases if nutritional support for any reason cannot be given through the enteral route, it has to be delivered by vein. A "supplemental" PN should substitute the difference between the actual oral/enteral intake and the estimated requirements (Grade C).

There is no rationale for giving PN if the nutrients intake by oral or enteral route is adequate, and for these reasons PN should not be administered in such conditions (Grade A).

Overview

- Weight loss to cancer-induced cachexia
- **Specific nutrition for cancer patients - Nutrition in Cancer Care**
- Summary

What can be Done??

- Conventional nutritional interventions have limited success
  - Standard oral nutritional products
  - Tube feeding
  - Total parenteral nutrition (TPN)

Conventional nutritional interventions ***do not*** address the underlying mechanism of Cancer-induced weight loss

What can be Done??

Clinical Nutrition 33 (2014) 749–753

Contents lists available at ScienceDirect

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

Randomized control trials

Randomized trial of the effects of individual nutritional counseling in cancer patients☆

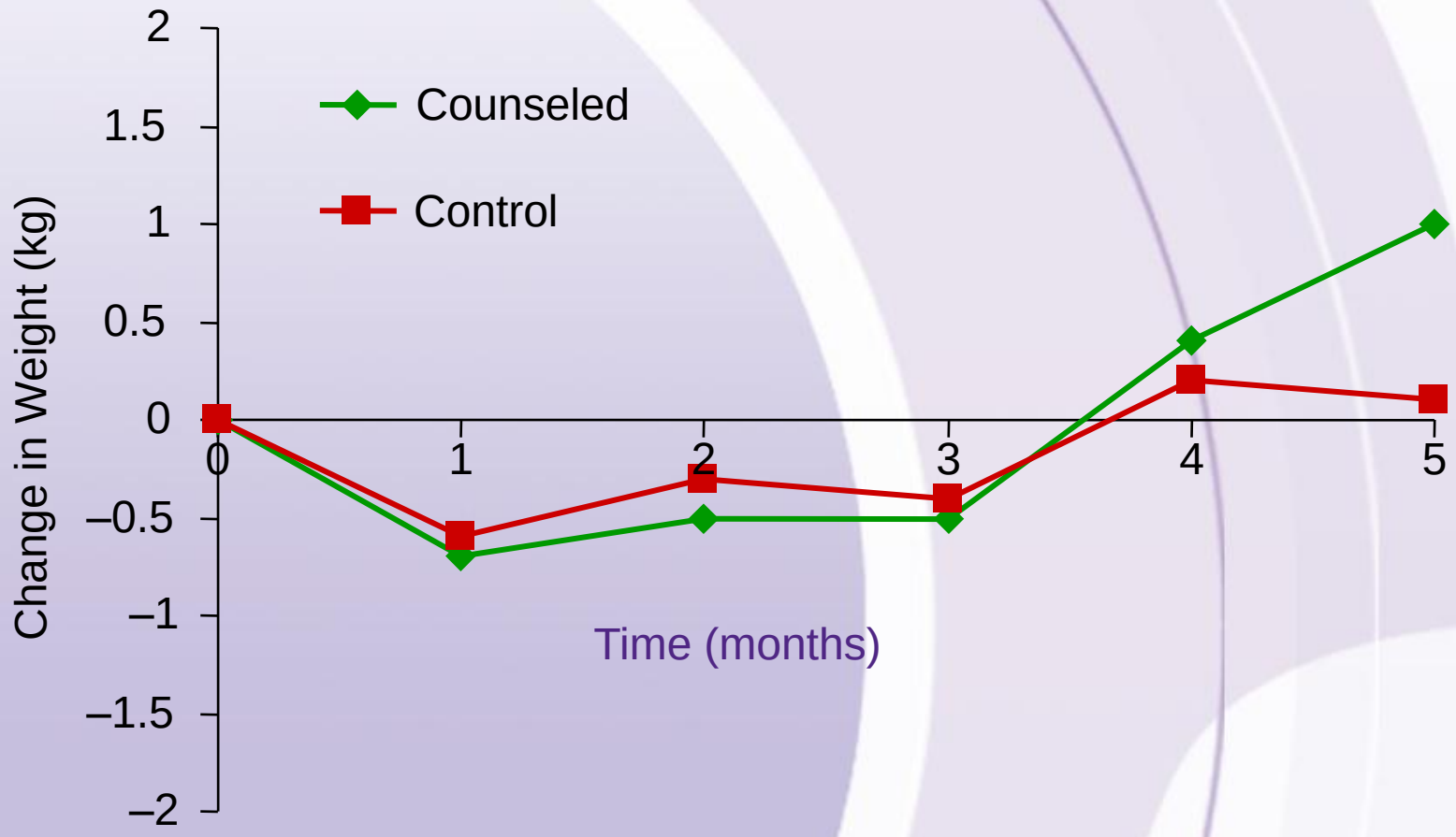
Grith M. Poulsen [a,c], Louise L. Pedersen [a,c], Kell Østerlind [b], Lene Bæksgaard [b], Jens R. Andersen [a,c,*]

[a] Department of Nutrition, Exercise and Sports, University of Copenhagen, DK-1958 Frederiksberg C, Denmark
[b] Department of Oncology 5073, Rigshospitalet, DK-2100 Copenhagen Oe, Denmark
[c] Nutrition Unit 5711, Rigshospitalet, DK-2100 Copenhagen Oe, Denmark

Conventional nutritional interventions ***do not*** address the underlying mechanism of Cancer-induced weight loss

Increasing Intake alone DOESN'T work

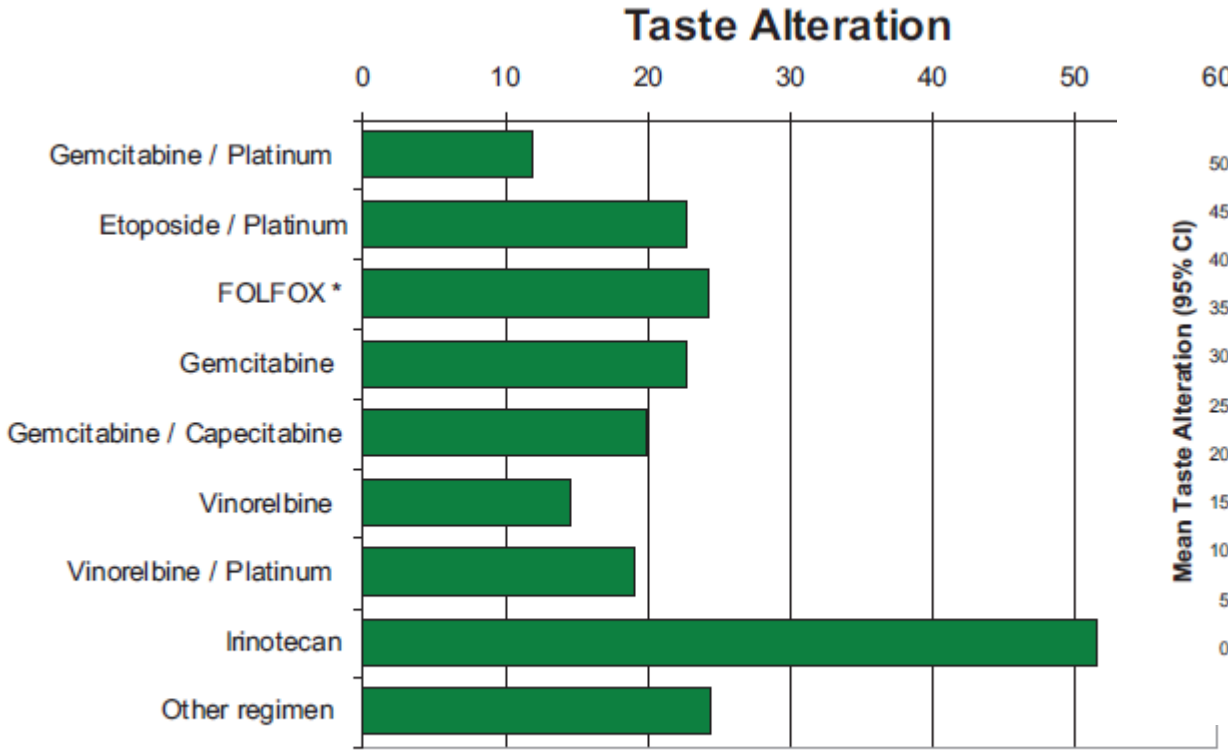
- 105 patients with small-cell lung, ovarian or breast cancer
- Significant increase in intake, but no significant weight gain



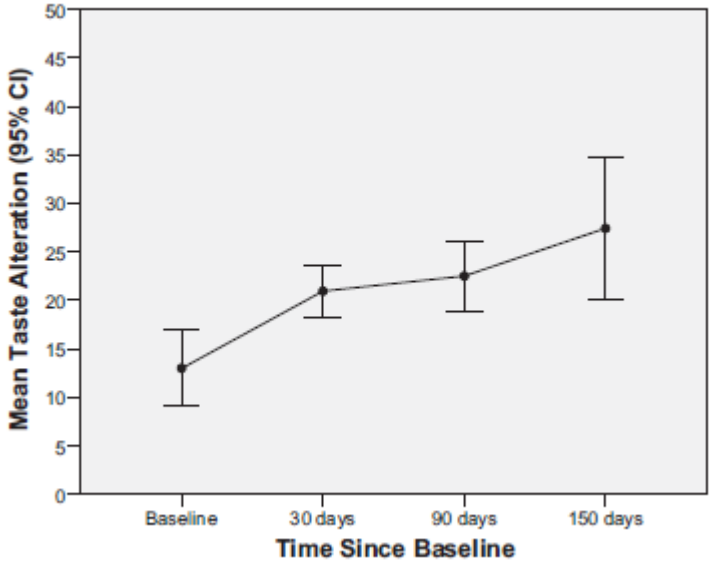
70% reported taste alterations (TA) during CT & symptoms persist months after CT

Lung cancer	54%
Pancreatic cancer	19%
Colorectal cancer	26%
Age: 65 years; male	57%

included in study between day 0 and 30 of CT



Course of taste alterations over time.



N=197

Zabernigg et al, Taste alterations in in Cancer Patients receiving Chemotherapy, The Oncologist CME program 2010

Association between Taste alterations and QoL

- EORTC QLQ – C30 + 2 additional questions

TAs are significantly associated with:

- Apetite loss

- Fatigue

- Nausea/vomiting

- Cognitive functioning

Zabernigg et al, Taste alterations in in Cancer Patients receiving Chemotherapy, The Oncologist CME program 2010

Challenges for intake

Taste alterations are common in cancer patients resulting from disease and/or treatment

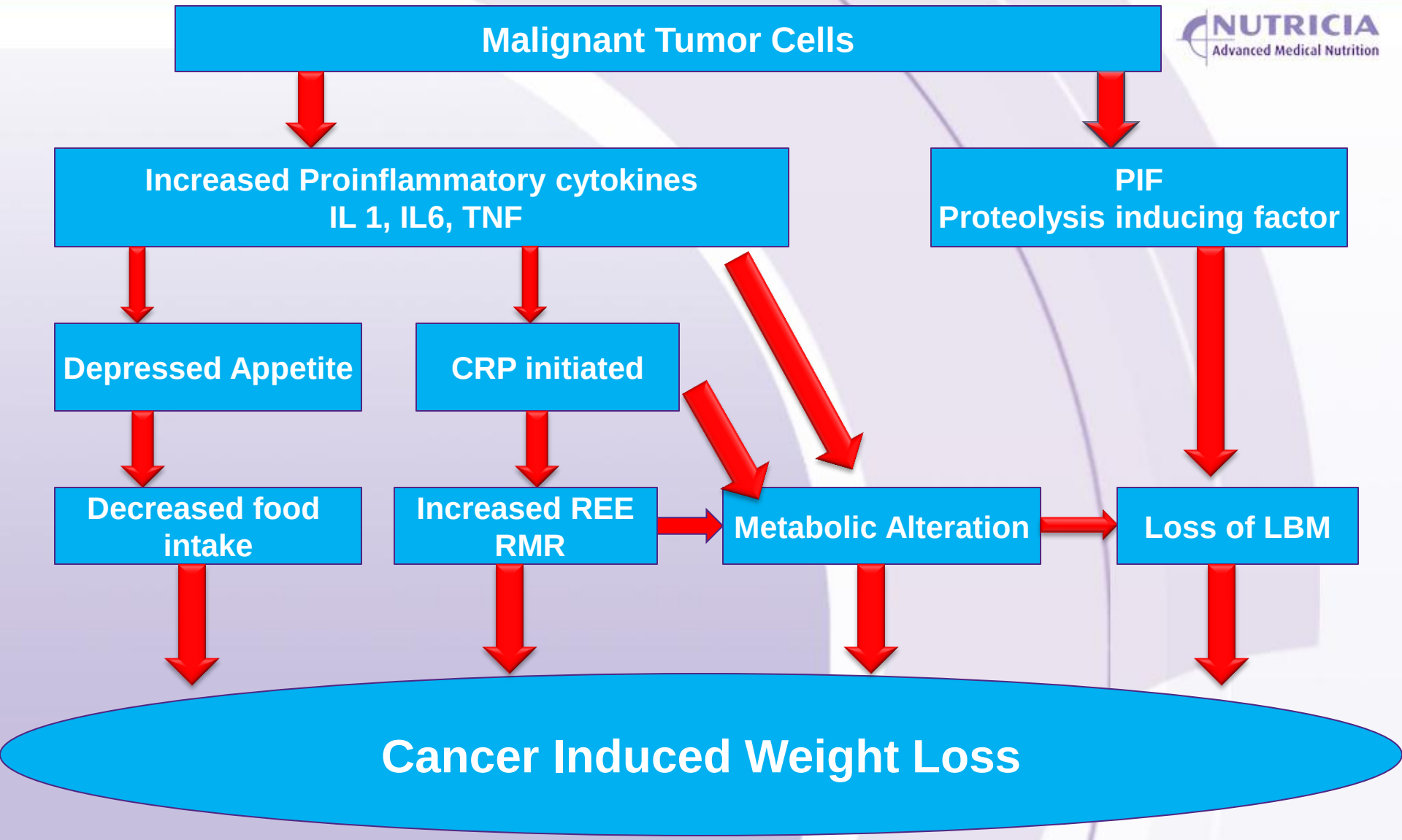
68% patients undergoing chemotherapy reported taste changes[1]:

- Food tastes like cardboard or sandpaper
- Too salty
- Too sweet
- Too sour
- Too bitter
- Metallic aftertaste

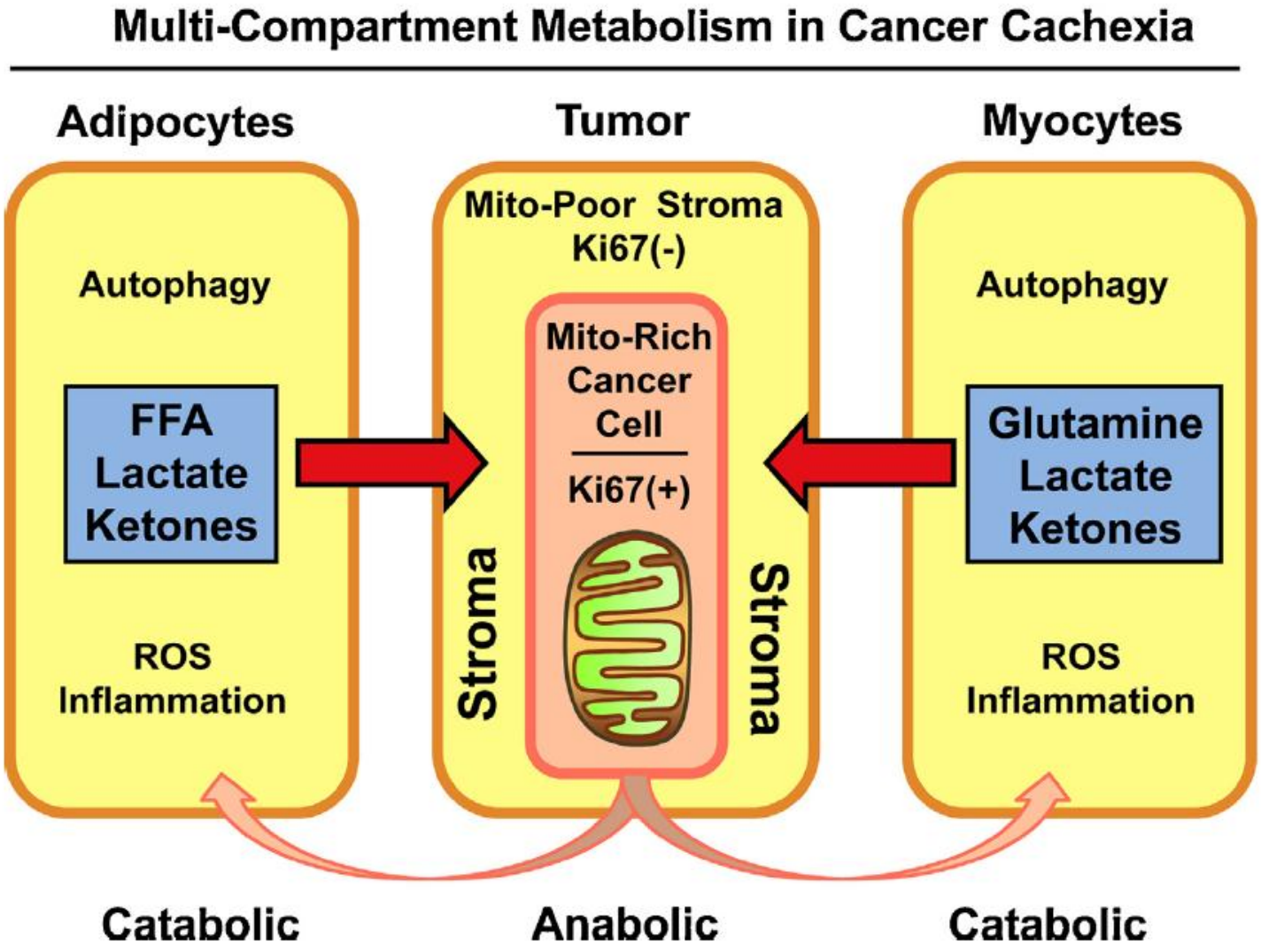
Prevalence of metallic taste ranged from 9.7 - 78% among patients with various cancers, chemotherapy treatments, and treatment phases [2]

[1] Wickham et al, 1999
[2] Ijpma et al, Cancer Treat Rev 2014

Mechanism of action
Cancer induced weight loss

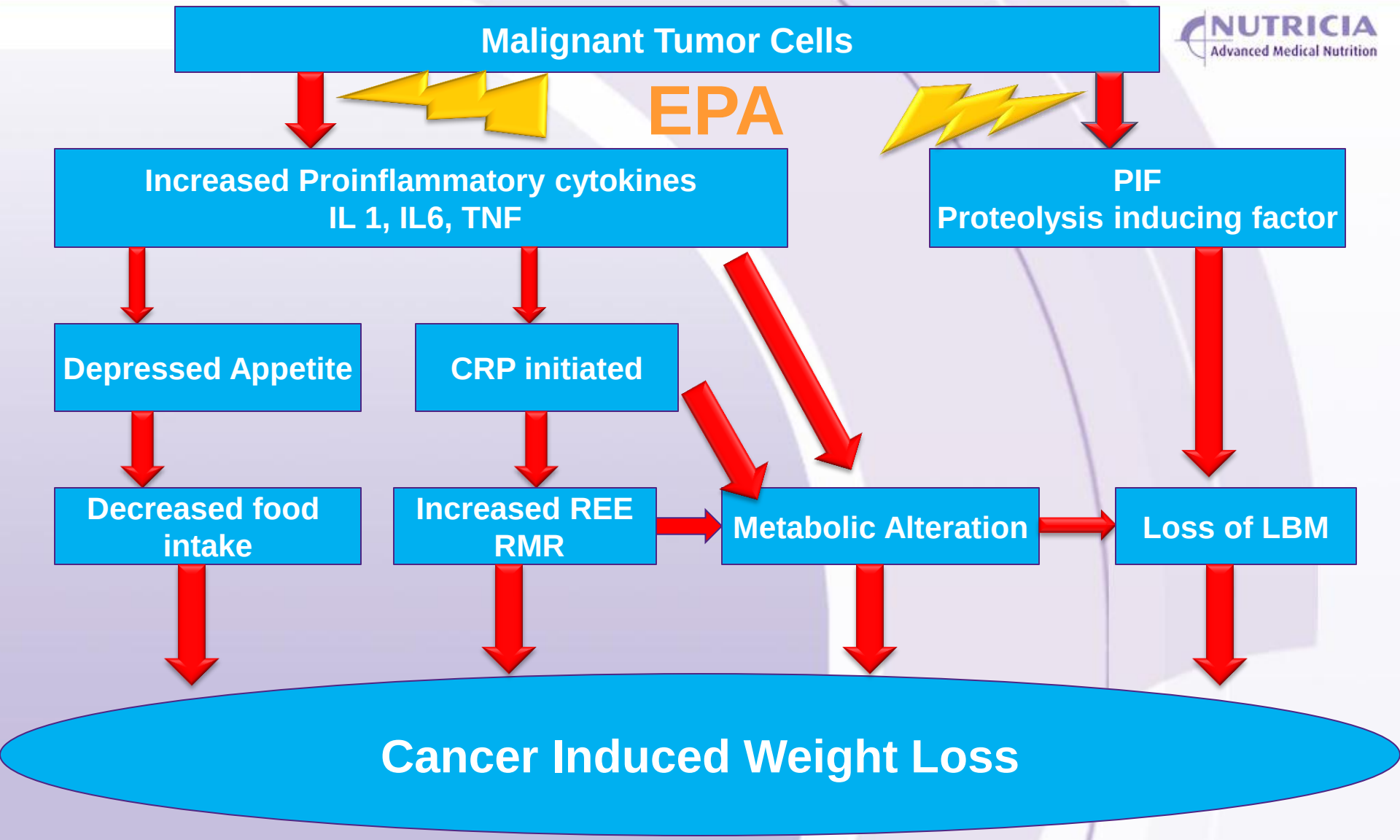


Catabolic cancer-associated fibroblasts transfer energy and biomass to anabolic cancer cells, fueling tumor growth



Martinez-Outschoorn UE et al. Sem Cancer Biol 2014; 25:47-60

Mechanism of action
Cancer induced weight loss



aspen
Clinical Guidelines

A.S.P.E.N. Clinical Guidelines: Nutrition Support Therapy During Adult Anticancer Treatment and in Hematopoietic Cell Transplantation

Journal of Parenteral and Enteral Nutrition
Volume 33 Number 5
September/October 2009 472-500

10.1177/0148607109341804
http://jpen.sagepub.com
hosted at
http://online.sagepub.com

8. ω-3 Fatty acid supplementation may help stabilize weight in cancer patients on oral diets experiencing progressive, unintentional weight loss. (Grade: B)

Clinical Study Model

EPA Studies

Wigmore 1996
2 g EPA/day
Weight Stabilization

Wigmore 2000
6 g EPA/day
Weight Stabilization

Barber 1999
Increase in weight and LBM

Barber 2001
Decrease in PIF and IL-6

aspen Clinical Guidelines

A.S.P.E.N. Clinical Guidelines: Nutrition Support Therapy During Adult Anticancer Treatment and in Hematopoietic Cell Transplantation

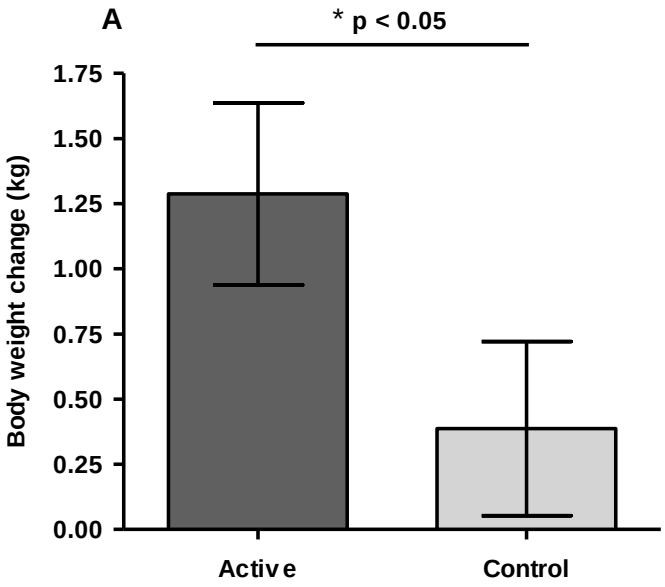
Journal of Parenteral and Enteral Nutrition
Volume 33 Number 5

tle or no increase in lean body mass.[102,105,106,111,112,116] A target dose of 2 g of eicosapentanoic acid daily appears appropriate. This may be administered as commercially available ω-3 enriched liquid nutritional supplements or as over-the-counter ω-3 fatty acid supplements (available in most pharmacies). Because these supplements are not commonly covered by health insurance, the cost of this intervention should be considered.

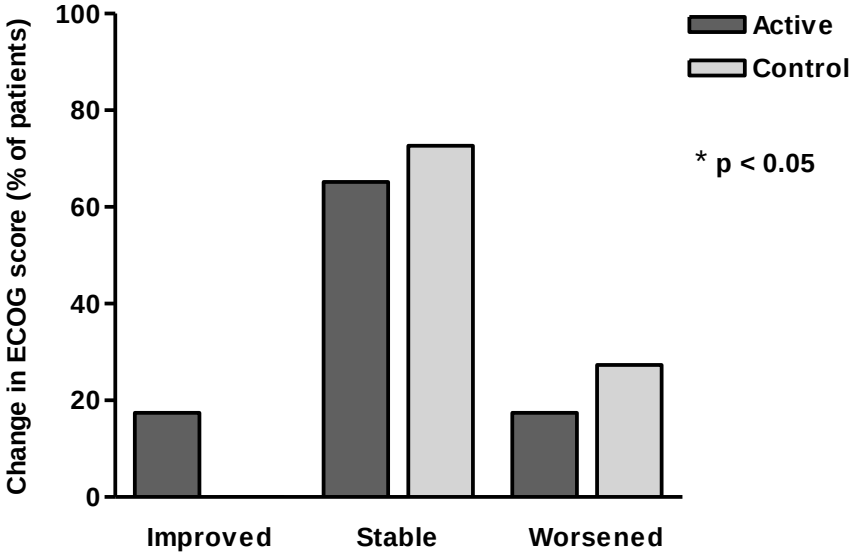
Improved body weight and performance after supplementation in newly diagnosed esophageal cancer patient

Journal of Cachexia, Sarcopenia and Muscle 2015; **6**: 32–44

Body weight change



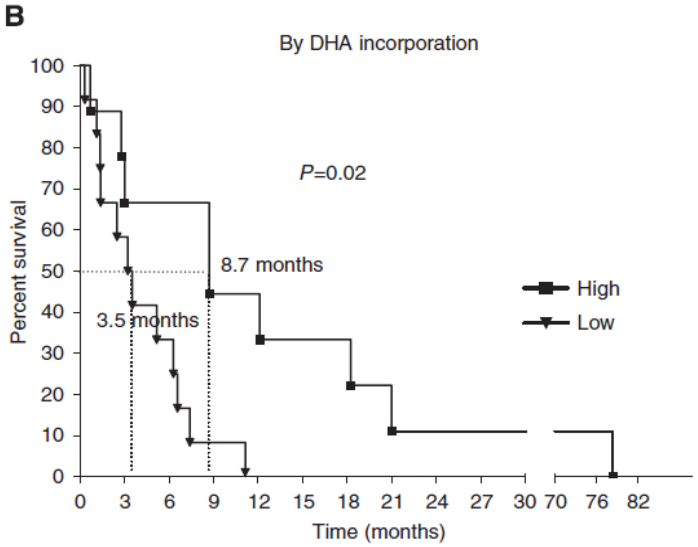
Performance score



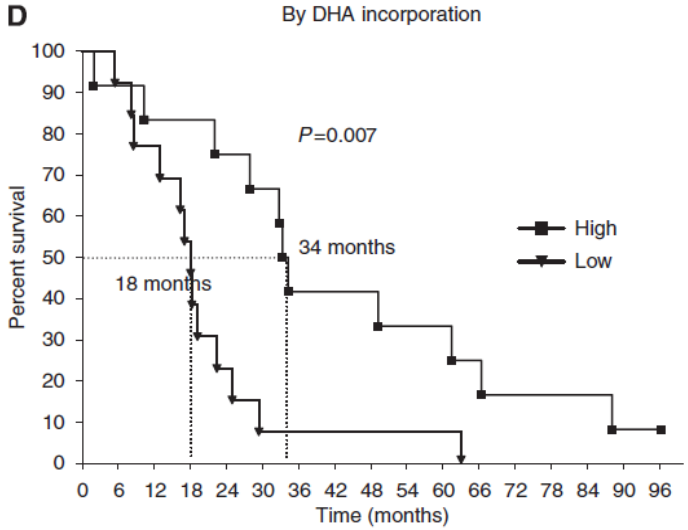
J Cachexia Sarcopenia Muscle. 2015 , 6(1):32-44

Improved outcome of FEC 75 chemotherapy in metastatic breast cancer

Time to progression



Overall survival



British Journal of Cancer (2009) 101, 1978–1985

www.bjcancer.com

Bougnoux et al., Br J Cancer 2009

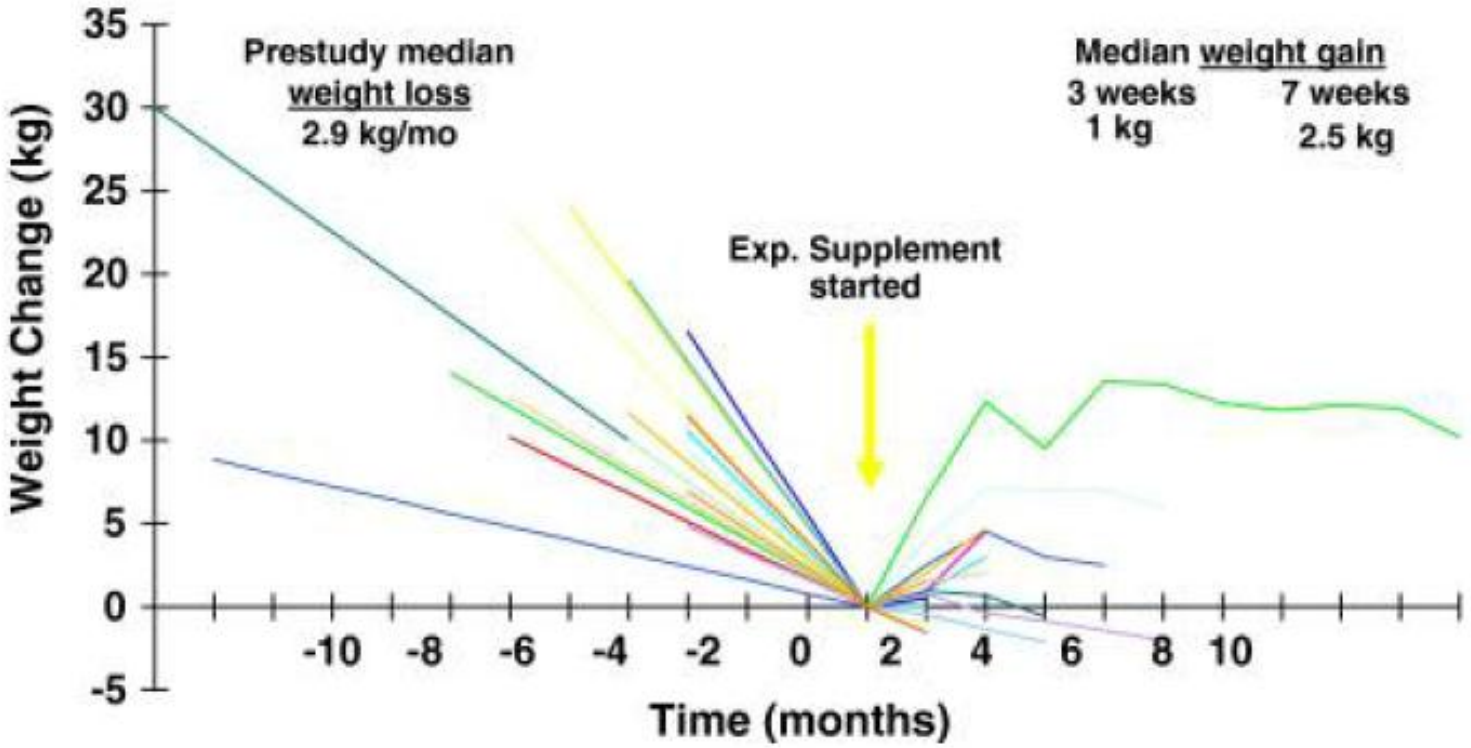
COLON

Effect of a protein and energy dense n-3 fatty acid enriched oral supplement on loss of weight and lean tissue in cancer cachexia: a randomised double blind trial

K C H Fearon, M F von Meyenfeldt, A G W Moses, R van Geenen, A Roy, D J Gouma, A Giacosa, A Van Gossum, J Bauer, M D Barber, N K Aaronson, A C Voss, M J Tisdale

Gut 2003;**52**:1479–1486

Cancer cachexia- ω3



Gut. 2003 52(10):1479-86.

ORIGINAL ARTICLE

Oral nutritional supplements containing n-3 polyunsaturated fatty acids affect quality of life and functional status in lung cancer patients during multimodality treatment: an RCT

BS van der Meij[1], JAE Langius[1], MD Spreeuwenberg[2], SM Slootmaker[3], MA Paul[4], EF Smit[5] and PAM van Leeuwen[4]

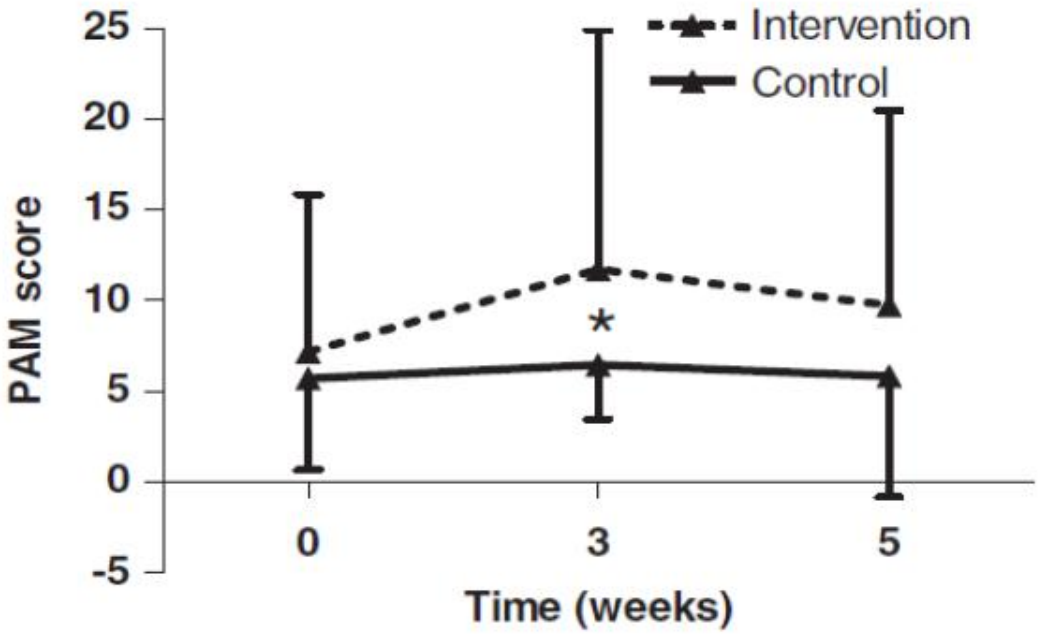


Figure 1. Physical activity (daily PAM score) over time for the I and C groups. Values are mean ± s.d., baseline: $n = 12$ (I), $n = 16$ (C); week 3: $n = 13$ (I) and $n = 17$ (C); week5: $n = 8$ (I), $n = 13$ (C). $^*P < 0.05$, difference between the I and C group (analysed by generalised estimating equations, with baseline value and sex as covariate).

European Journal of Clinical Nutrition (2012) 66, 399 - 404

www.nature.com/ejcn

Eur J Clin Nutr. 2012, 66(3):399-404

Oral Nutritional Interventions in Malnourished Patients With Cancer: A Systematic Review and Meta-Analysis

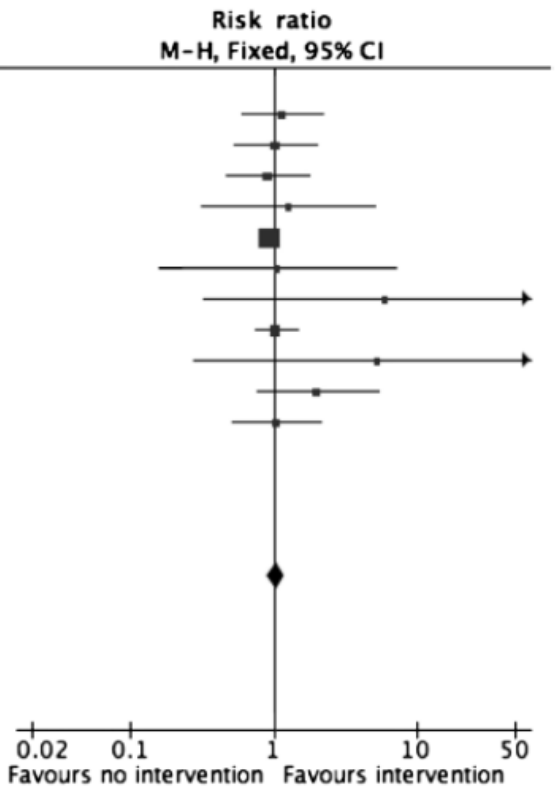
Christine Baldwin, Ayelet Spiro, Roger Ahern, Peter W. Emery

Not reduce risk of death

Study or Subgroup	Intervention Events	Intervention Total	No intervention Events	No intervention Total	Weight	Risk ratio M-H, Fixed, 95% CI
Baldwin et al. 2008a (17)	29	90	9	32	8.0%	1.15 [0.61–2.15]
Baldwin et al. 2008b (17)	25	86	9	32	7.9%	1.03 [0.54–1.97]
Baldwin et al. 2008c (17)	22	86	9	32	7.9%	0.91 [0.47–1.76]
Elkort et al. 1980 (25)	4	24	3	23	1.8%	1.28 [0.32–5.10]
Evans et al. 1987 (26)	94	111	62	69	46.0%	0.94 [0.84–1.05]
Isenring et al. 2004 (27)	2	29	2	31	1.2%	1.07 [0.16–7.10]
Lovik et al. 1996 (28)	3	28	0	24	0.3%	6.03 [0.33–111.27]
Moloney et al. 1983 (29)	27	42	26	42	15.6%	1.04 [0.75–1.44]
Ollenschlager et al. 1992(24)	2	15	0	16	0.3%	5.31 [0.28–102.38]
Ovesen et al. 1993 (30)	12	57	5	48	3.3%	2.02 [0.77–5.33]
Persson et al. 2002 (18)	13	67	13	70	7.7%	1.04 [0.52–2.09]
Ravasco et al. 2005a (19)	0	25	0	13		Not estimable
Ravasco et al. 2005b (19)	0	25	0	12		Not estimable
Ravasco et al. 2005c (20)	0	37	0	19		Not estimable
Ravasco et al. 2005d (20)	0	37	0	18		Not estimable
Subtotal (95% CI)		759		481	100.0%	1.06 [0.92–1.22]
Total events	233		138			

Heterogeneity: $\chi^2 = 8.69$, $df = 10$ ($P = .56$); $I^2 = 0\%$

Test for overall effect: $Z = 0.80$ ($P = .43$)



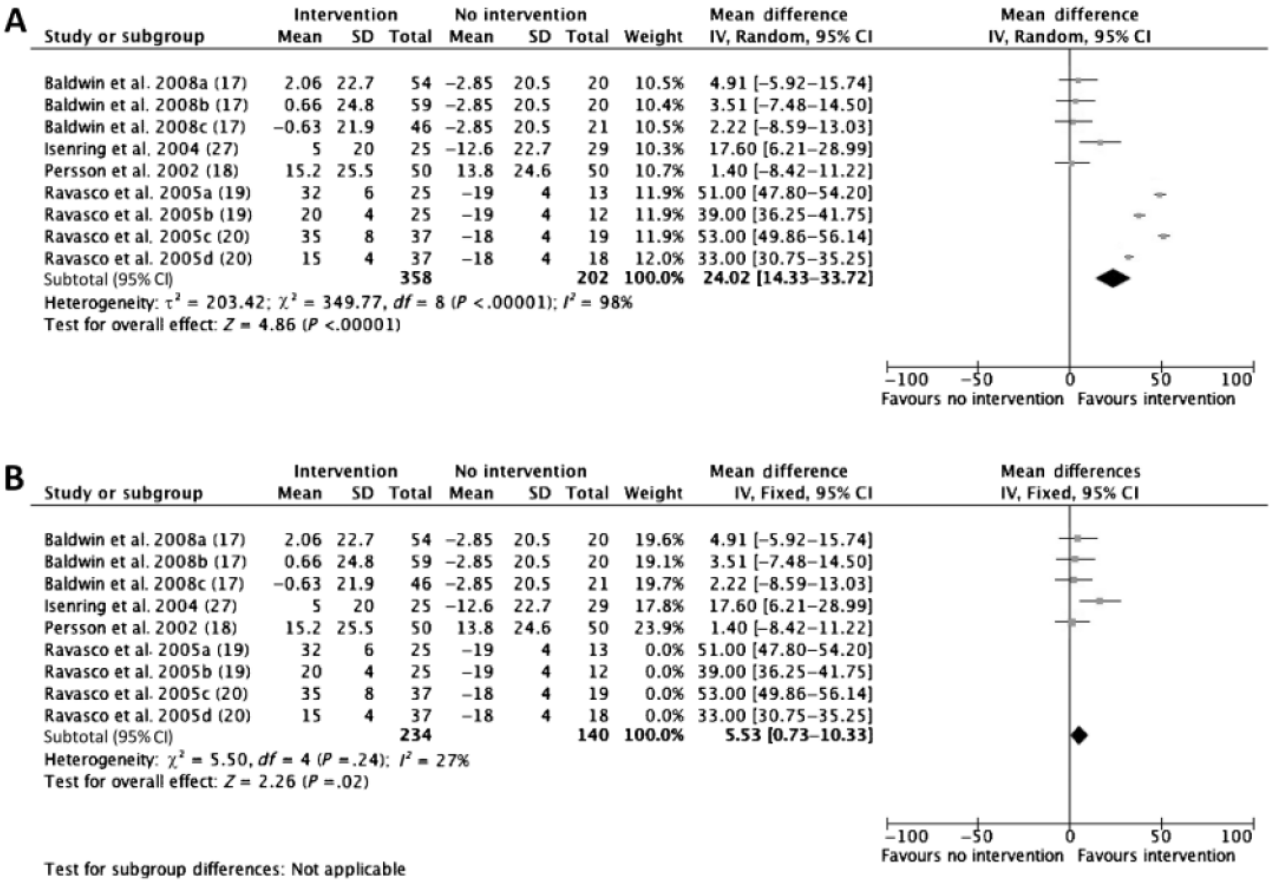
Oral nutritional interventions and mortality meta-analysis.

J Natl Cancer Inst. 2012;104(5):371-85

Oral Nutritional Interventions in Malnourished Patients With Cancer: A Systematic Review and Meta-Analysis

Christine Baldwin, Ayelet Spiro, Roger Ahern, Peter W. Emery

Improve the quality of life



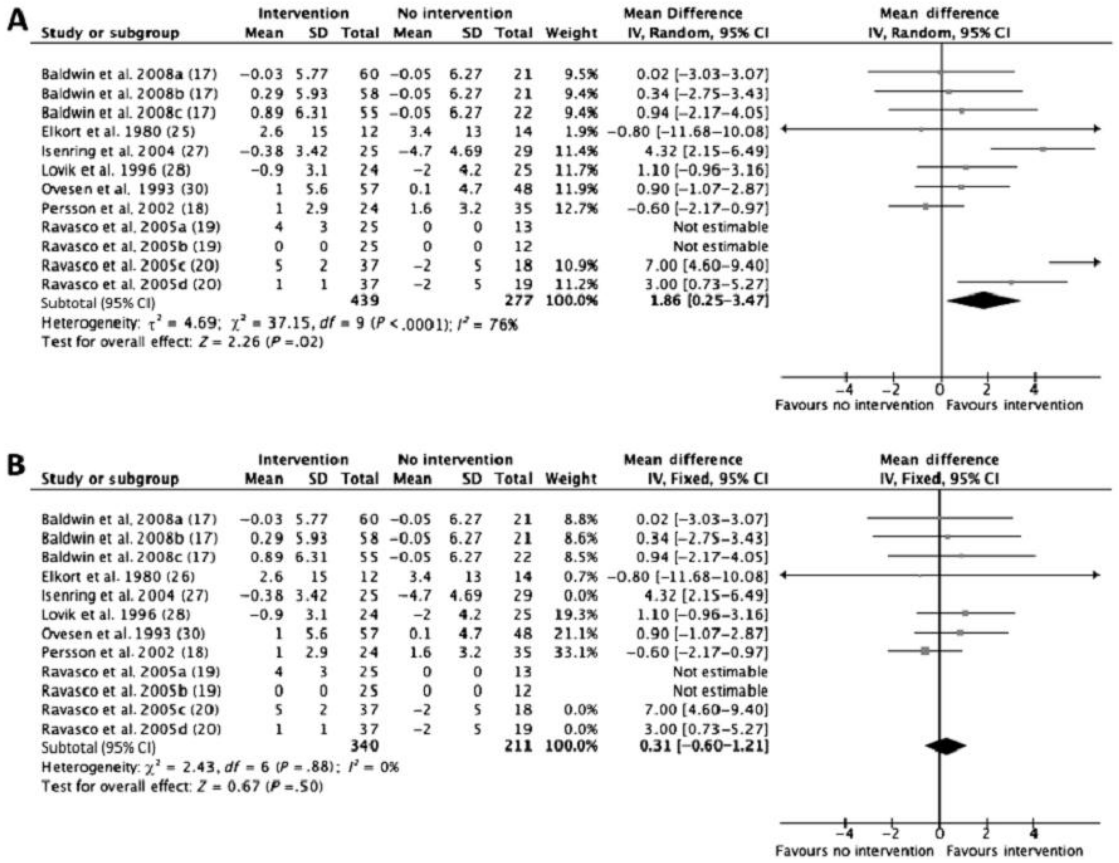
Oral nutritional intervention and global quality of life metaanalysis

J Natl Cancer Inst. 2012;104(5):371-85

Oral Nutritional Interventions in Malnourished Patients With Cancer: A Systematic Review and Meta-Analysis

Christine Baldwin, Ayelet Spiro, Roger Ahern, Peter W. Emery

Weight gain



Oral nutritional interventions and weight gain meta-analysis.

J Natl Cancer Inst. 2012;104(5):371-85

Clinical Nutrition 30 (2011) 759–768

Contents lists available at ScienceDirect

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

Original article

Muscle protein synthesis in cancer patients can be stimulated with a specially formulated medical food☆

Nicolaas E.P. Deutz [a], Ahmed Safar [b], Scott Schutzler [a], Robert Memelink [c], Arny Ferrando [a], Horace Spencer [d], Ardy van Helvoort [c], Robert R. Wolfe [a,*]

[a] Center for Translational Research in Aging & Longevity, Donald W. Reynolds Institute on Aging, University of Arkansas for Medical Sciences, 4301 W. Markham St. Slot 806, Little Rock, AR 72205, USA
[b] Veterans Administration Hospital, Little Rock, AR, USA
[c] Nutricia Advanced Medical Nutrition, Danone Research – Centre for Specialised Nutrition, Wageningen, The Netherlands
[d] Department of Biostatistics, University of Arkansas for Medical Sciences, Little Rock, AR, USA

Development of Forticare: Adapted Medical Nutrition for cancer patients

FortiCare is nutritionally complete

Provides high protein and is EPA/DHA enriched

- **EPA to attenuate cachexia, reduce inflammation and support immune function**
- **Energy and protein to meet increased needs of cancer patients**
- **Adapted taste, small volume (for improved compliance)**

NUTRICIA Forticare

Clinical trial in Vietnam

Clinical trial: Randomized controlled trial (RTC) on 60 patients

CILW : 3,3 kg per month.

Colorectal cancer patients with malnutrition or cachexia.

Hospitals:

- **Department of Surgery C – K Hospital.**
- **Clinical Nutrition Center of Bach Mai Hospital**
- **Oncology and Palliative Care Unit, Hanoi Medical University Hospital**

Date: 12/2012 → 6/2015

NUTRICIA Forticare

Clinical trial in Vietnam

Nutrition intervention with EPA (2g / day): average weight gain of 3 kg/patient after 8 weeks of treatment.

Nutrition interventions EPA contributes to improve the quality of life for patients:

- **100% appetite (Delicious and good taste)**
- **Weight gain: 3kg (8weeks)**
- **Increase the size arm circumference**
- **Improves albumin/blood**

EPA treatment for colorectal cancer patients:

Nutrition support should be continuous treatment.
Protein: 1,5 - 1,7g / kg / day
Energy: 35 kcal / kg / day
EPA 2g/day

Recommendation: The EPA should be included in the treatment for cancer patients to prevent weight loss and cachexia.

ESPEN Guidelines on Enteral Nutrition: Non-surgical oncology ☆

J. Arends[a,*], G. Bodoky[b], F. Bozzetti[c], K. Fearon[d], M. Muscaritoli[e], G. Selga[f], M.A.E. van Bokhorst-de van der Schueren[g], M. von Meyenfeldt[h], DGEM: ☆☆ G. Zürcher, R. Fietkau, E. Aulbert, B. Frick, M. Holm, M. Kneba, H.J. Mestrom, A. Zander

Clinical Nutrition (2006) **25**, 245–259

The efficacy of treatment with EPA/ONS appears to be critically dependent on the patients' compliance. In addition to anorexia, patients' compliance with prescribed high-energy and high-protein EPA/ONS is limited by the frequently complained unpleasant aftertaste. Therefore, it will be necessary to improve the palatability of EPA/ONS in order to improve patients' compliance with treatment and hopefully its effectiveness.

Any food that is not consumed is never nutritious!

Prof Jeya Henri

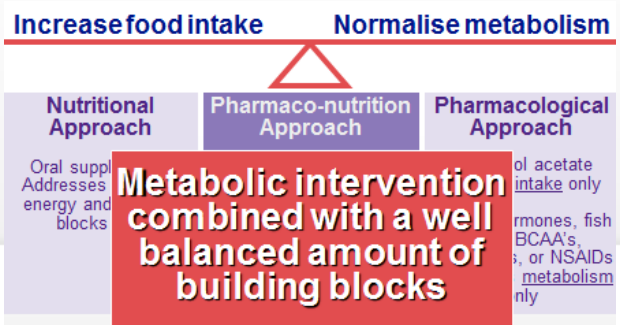
WAYS TO PROVIDE > 2 GRAMS OF EPA / DAY

Eat large amounts of fatty fish

- Herring, Salmon, Tuna, Mackerel, Sardines….

Fish oil capsules

Emulsified oils combined with macro- and micro- nutrients



FORTICARE: A CONVENIENT WAY TO PROVIDE THE ESSENTIAL NUTRITION FOR CANCER PATIENTS

Oncology Adapted Medical Nutrition:

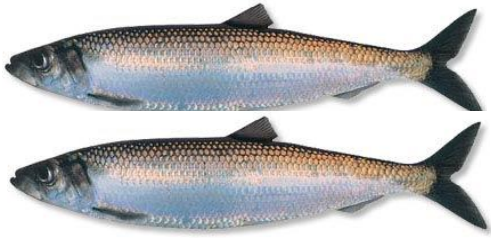
- ✓ Energy dense
- ✓ High in protein
- ✓ Nutritionally complete
- ✓ Low GI
- ✓ Small volume
- ✓ Low viscosity
- ✓ Enriched with EPA
- ✓ Excellent taste

FULFILL PATIENTS NEEDS IN A CONVENIENT WAY

Specific patient needs
High energy
High amount of protein
High quality of protein
All other macro-nutrients
Dietary fibers
Balanced micro-nutrients
EPA (6 ounce of fat fish)

Convenience
Small volume
Complete
Balanced
Low viscosity
Tasty

2 herrings/day



EPA example

2.2 gr EPA/day in FortiCare

NUTRICIA
Forticare

Oncology Adapted Medical Nutrition

Oncology adapted nutritional support with EPA for cancer patients

WHY:

- To improve the outcome of your cancer treatment and QOL for the patient.

WHEN:

- **Implement screening for nutritional status of every newly diagnosed cancer patient and consider intervention options in every stage of the disease.**

HOW:

- **Intensive nutritional support with nutrients and metabolic modulators in a convenient and palatable way.**

Comparison

(BS. Lâm Đức Hoàng
Bệnh viện Ung bướu TPHCM)

=

+

+

=

↓

↓

≠

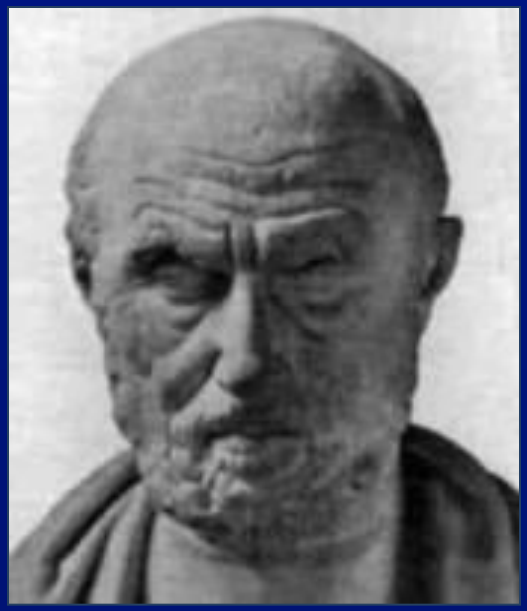
Overview

- Weight loss to cancer-induced cachexia
- Specific nutrition for cancer patients - Nutrition in Cancer Care
- **Summary**

Summary

- **Early detection and signs of cancer-induced weight loss in every stage of the disease.**
- **Cancer cachexia affects clinical outcome, increased dose-limiting toxicities, receive less treatment (dosage), and treatment interruption.**
- **Conventional nutritional interventions *do not* address the underlying mechanism of cancer-induced weight loss and cancer cachexia**
- **High energy, High protein and high EPA (2g/day) are recommended for cancer patents.**
- **Considered taste alterations, flavor and the patients' compliance with treatment.**
- **Hyperglycemia is common in cancer patients and low Glycemic index is suitable for cancer patients.**

"Let medicine be thy food, and food be thy medicine."



Hippocrates of Cos, Greece
460-377 B.C.

CẢM ƠN SỰ CHÚ Ý LẮNG NGHE CỦA QUÝ VỊ!

Thank You

For Your Attention!!!