

Entry Level Clinical Nutrition Part XXI

Putting it all together

Jeffrey Moss, DDS, CNS, DACBN

jeffmoss@mossnutrition.com

413-530-0858 (cell)

1

“The world is full of obvious
things which nobody by any
chance ever observes...”

Arthur Conan Doyle
The Hound of Baskervilles

2

If it looks like a duck, quacks like a duck, and walks like a duck, it's probably a duck.

3

Sweet DREAMS

Simona Pozzetto of Florence opens a gluten-free baking business

By LILY BOUVIER
Contributing Writer

Simona Pozzetto, 44, of Florence, said a good fresh-baked pastry can be a singular pleasure.

"You taste it," said Pozzetto, "and it gives you that mo-

"Because a gluten-free life does NOT mean a flavorless life."

Lots of recipe research

Coming up with successful recipes required a lot of research and recipe testing.

Daily Hampshire Gazette,

September 3, 2012

three years she has had to keep to a gluten-free diet. That has made finding sweets a challenge, she said. Bread, cake, brownies, cookies, muffins, scones, tarts and tortes all typically require flour that contains gluten. Even when she managed to find products labeled as gluten-free, Pozzetto said, she discovered that they sometimes were not as advertised.

She sensed a niche baking market. So last fall, when her youngest son started school, Pozzetto, whose formal training is in social work, decided to begin a gluten-free baking business in her home kitchen, Simona's Gluten-Free Baked Goods.

The business motto is

of her baked goods to local stores.

"Every time I brought something to people, what they would say is 'I couldn't tell it's gluten-free,'" she said. "I knew that if somebody thought that, it would be a winner."

Pozzetto, who is licensed for both wholesale and retail business, bakes between 250 and 300 items each week. She sells about a third directly to customers, and the remainder to local markets, she said. Her products are available at River Valley Market and State Street Fruit Store in Northampton, Cooper's Corner and Cup and Top

See GLUTEN / Page C2



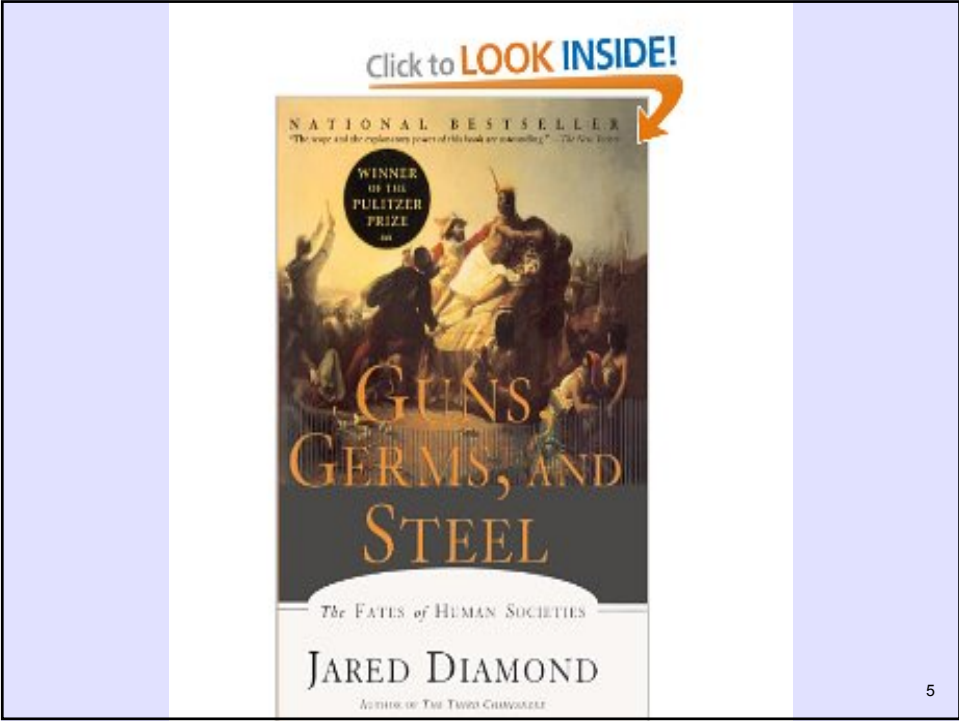
KEVIN GUTTING

Simona Pozzetto has established a gluten-free baking business in her Florence home. In the background are two of her three children, Tess, 8, and David, 11.



KEVIN GUTTING

A box of goodies from Simona Pozzetto's business, Simona's Gluten-free Baked Goods.



Special Article

Effect of whole grains on markers of subclinical inflammation

Michael Lefevre and Satya Jonnalagadda

The reduction of subclinical inflammation has been suggested as a potential mechanism to explain the favorable association between whole-grain consumption and reduced risk for cardiovascular disease, diabetes, and certain cancers. This review examines evidence for the effects of whole-grain consumption on markers of subclinical inflammation derived from 13 epidemiological and 5 interventional studies retrieved from a search of the PubMed database. Epidemiological studies provide reasonable support for an association between diets high in whole grains and lower C-reactive protein (CRP) concentrations. After adjusting for other dietary factors, each serving of whole grains is estimated to reduce CRP concentrations by approximately 7%. In contrast to epidemiological studies, interventional studies do not demonstrate a clear effect of increased whole-grain consumption on CRP or other markers of inflammation. Issues related to insufficient length of intervention,

Lefevre M & Jonnalagadda S. Effect of whole grains on markers of subclinical inflammation, *Nutr Rev*, Vol. 70, No. 7, pp. 387-396, July 2012

INTRODUCTION

There is a substantial body of evidence supporting the association between higher whole-grain consumption and reduced risk for the development of major chronic diseases. Prospective population studies show that individuals who consume diets higher in whole grains have a reduced risk of developing cardiovascular disease,¹⁻³ type 2 diabetes,⁴⁻⁶ and certain types of cancer.⁷⁻¹⁰ Based on

inflammation. Below, the evidence linking whole grain consumption and subclinical inflammation is reviewed.

SELECTION OF STUDIES FOR REVIEW

The PubMed database was searched (last search, May 2011) using the search string "Whole OR unrefined OR brown) AND (arabin* OR cereal* OR whole OR oat* OR

"After adjusting for other dietary factors, each serving of whole grains is estimated to reduce CRP concentrations by approximately 7%. In contrast to epidemiologic studies, interventional studies do not demonstrate a clear effect of increased whole-grain consumption on CRP or other markers of inflammation."

Correspondence: M Lefevre, Department of Nutrition, Dietetics and Food Science, Utah State University, 9615 Old Main Hill, Logan, UT 84322-9615, USA. E-mail: michael.lefevre@usu.edu. Phone: +1-435-797-3821; Fax: +1-435-797-8117.

Key words: C-reactive protein, inflammation, interleukin-6, whole grains

doi:10.1111/j.1753-4887.2012.00487.x

Nutrition Reviews 70: 387-396

387

6



Sourdough lactobacilli and celiac disease

Marco Gobetti*, Carlo Giuseppe Rizzello, Raffaella Di Cagno, Maria De Angelis

Dipartimento di Protezione delle Piante e Microbiologia Applicata, Università degli Studi di Bari, Via G. Amendola 165/a, 70125 Bari, Italy

Available online 12 September 2006

Abstract

Celiac disease (CD) is one of the most common food intolerances. The only effective treatment for CD is a strict adherence to a gluten-free diet throughout the patient's lifetime. Gluten-free products are not widely available and are usually more expensive than their gluten-containing counterparts. There is, therefore, an urgent need to develop safe and effective therapeutic alternatives, to develop high-quality gluten-free products and to investigate the potential of the bread making biotechnology following ancient protocols which include long-time fermentation.

This review describes as starters for sourdough bread not only as current tolerated baked goods but also as potential probiotics.

Keywords: Celiac disease; Sourdough lactobacilli; Probiotic activity; Sourdough bread and pasta

1. Introduction

Celiac disease (CD), also known as celiac sprue or gluten-sensitive enteropathy, is a food hypersensitivity disorder caused by an inflammatory response to wheat gluten and similar proteins of barley and rye (Maki et al., 2003). Genes encoding HLA-DQ2 and HLA-DQ8 molecules are the single most important predisposing genetic factor. However, although these polymorphisms are necessary, they are not sufficient for disease development. HLA-DQ2 and HLA-DQ8 predispose to disease development by preferential presentation to mucosal CD4⁺ T cells of Pro-rich gluten peptides that have undergone deamidation by the enzyme tissue transglutaminase. Fewer details are known about the effector mechanisms that lead to the development of the typical celiac lesion (villous atrophy, crypt hyperplasia and infiltration of inflammatory cells), but, once activated, gluten-reactive CD4⁺ T cells produce cytokines and are likely to control the inflammatory

reactions that produce celiac lesions (Solid and Khosla, 2003).

Reports of CD date back to the first century A.D. (Adams, 1856), but it was not until 1888 that Samuel Gee gave the classical description of the disease (Gee, 1888), and only in the 1950s, Dicke demonstrated that removal of wheat from diet alleviated symptoms and signs of CD (Van Berge-Henegouwen and Mulder, 1993). Currently, CD prevalence has been estimated to be 1 in ca. 100 people worldwide (Hamer, 2005; Solid and Khosla, 2005). Such a rate establishes CD as one of the most common food intolerances (Fasano and Catassi, 2001). The only effective treatment for CD is a strict adherence to a gluten-free diet throughout the patient's lifetime, which in time results in clinical and mucosal recovery. Gluten is, however, a common and in many countries unlabeled ingredient in the human diet, presenting a big challenge for CD patients. Unsurprisingly, dietary compliance is, at the best, imperfect in a large fraction of patients, especially adolescents and adults. There is therefore an urgent need to develop safe and effective alternatives.

Beyond genetic predisposition, several environmental factors influenced CD prevalence. Recent epidemiological

*Corresponding author. Tel.: +39 080 5442949; fax: +39 080 5442911. E-mail address: gobetti@agr.uniba.it (M. Gobetti).

Commentary

Is folic acid good for everyone?^{1,2}

A David Smith, Young-In Kim, and Helga Refsum

ABSTRACT

Fortification of food with folic acid to reduce the number of neural tube defects was introduced 10 y ago in North America. Many countries are considering whether to adopt this policy. When fortification is introduced, several hundred thousand people are exposed to an increased intake of folic acid for each neural tube defect prevented.

by the SACN that ~77–162 NTD pregnancies would be prevented each year by fortification in the United Kingdom at a level of 300 µg folic acid/100 g flour. Thus, between 370 000 and 780 000 people in the United Kingdom will be exposed to extra folic acid for each infant saved. Can we be sure that, out of three-quarters of a million people, less than one person will not

Smith AD et al. Is folic acid good for everyone? *Am J Clin Nutr*, Vol. 87, pp. 517–33, 2008.

Some very experienced users of antifolate drugs used against malaria, rheumatoid arthritis, psoriasis, and cancer. In the elderly, a combination of high folate levels and low vitamin B-12 status may be associated with an increased risk of cognitive impairment and anemia and, in pregnant women, with an increased risk of insulin resistance and obesity in their children. Folate has a dual effect on cancer, protecting against cancer initiation but facilitating progression and growth of preneoplastic cells and subclinical cancers, which are common in the population. Thus, a high folic acid intake may be harmful for some people. Nations considering fortification should be cautious and stimulate further research to identify the effects, good and bad,

to consider the theoretical basis for potential harm and to review selected observational studies that are consistent with the possible harm; it is not meant to be a systematic review of the evidence, but rather to highlight issues for further discussion. We wish to stimulate an open debate on these issues, with a view to better informing policy makers in countries that are considering fortification. We will argue that what is urgently needed now is targeted research.

The plan of the article is as follows: after a brief review of the biochemistry of folates and a comparison of folate with natural folates, we will look at the evidence that elevated concentrations

"High blood concentrations of folic acid may be related to decreased natural killer cell cytotoxicity, and high folate status may reduce the response to antifolate drugs used against malaria, rheumatoid arthritis, psoriasis, and cancer. In the elderly, a combination of high folate levels and low vitamin B-12 status may be associated with an increased risk of cognitive impairment and anemia and, in pregnant women, with an increased risk of insulin resistance and obesity in their children."

and children sufficient justification for exposing the entire population to an increased intake of folic acid? It has been estimated

Accepted for publication September 21, 2007.

Research

Research

The effect of clinical history on accuracy of electrocardiograph interpretation among doctors working in emergency departments

Monique F Cruz
BSc (Hons), MBBS
Emergency Registrar
James Edwards
MB BS, MRCP, FRACP
Emergency Physician
Michael M Doh
MB BS, MRCP, FRACP
Emergency Physician
Elizabeth H Barnes
MBBS
Baccus
Emergency Department
Royal Prince Alfred
Hospital, Sydney, NSW
344 Macquarie Street
Sydney, NSW
cruzmf@gmail.com
MJA 2012; 197: 161-165
doi:10.5694/mja12.00806

Abstract
Accurate interpretation of electrocardiographs (ECGs) is essential for doctors to avoid diagnostic errors and delays in time-critical management. Diagnostic errors can result from knowledge deficits but also from cognitive biases and heuristics (mental shortcuts).^{1,2} Clinical history, patient age, sex, and other factors can influence ECG interpretation. We investigated the effect of clinical history on ECG interpretation accuracy among doctors working in emergency departments.

Objective: To investigate whether bias in clinical history affects accuracy of electrocardiograph (ECG) interpretation among doctors working in emergency departments.
Design and setting: Observational study conducted at four teaching hospitals in Sydney from May to September 2011.
Participants: Emergency registrars and physicians (senior doctors), and interns, resident medical officers and senior resident medical officers (junior doctors).

Cruz MF et al. The effect of clinical history on accuracy of electrocardiograph interpretation among doctors working in emergency departments, *Med J Aust*, Vol. 197, No. 3, pp. 161-165, August 6, 2012.

history positively biased history was associated with lower mean scores (95% CI, 35%–49%, $P < 0.001$) and negatively biased history was associated with 34% lower mean scores (95% CI, 29%–39%, $P < 0.001$).
Conclusion: Bias in clinical history significantly influenced the accuracy of ECG interpretation. Strategies that reduce the detrimental impact of cognitive bias and improved ECG training for doctors are recommended.

Methods

We conducted an observational study of ECG interpretation by doctors working in EDs at four teaching hospitals.

Participants provided written consent and were blinded to the study objective. Demographic data collected included age, sex, and years of experience.

"The overall mean accuracy of ECG interpretation was 52%..."

Results: Some studies of ECG interpretation have shown that providing a clinical history or vignette has no significant effect on diagnostic accuracy,^{3,4} but others have shown that history suggestive of the correct diagnosis increases diagnostic accuracy and misleading history decreases diagnostic accuracy.⁵ We aimed to determine whether bias in the clinical history affects the accuracy of ECG interpretation by ED doctors.

Intervention: ECGs were obtained from hospital patients, textbooks and internet-based sources. They were reviewed without clinical history by a cardiologist and a senior emergency physician.

MJA 197 (3) - 6 August 2012

161

9

What influences clinical decision making?



Annette Katelaris
MBBS, FRACP
skatelaris@mpa.com.au
doi:10.5694/mja12.00806

As doctors, we spend a lot of time learning facts but little time is formally dedicated to learning how to think. Ideally, this skill is learnt ("picked up") during the years of clinical teaching at the bedside, in the clinic and in the operating theatre. Errors in clinical interpretation and reasoning can occur at any point during patient care. There are often due not to a lack of knowledge or competence, but to the decision-making processes of humans in situations that are clinically complex, uncertain, and pressured by time and emotion.

In this issue, Cruz and colleagues (page 161) looked at the clinical reasoning skills of junior and senior emergency medicine staff by testing their ability to accurately interpret electrocardiographs (ECGs) with and without clinical history.

Accuracy was affected by knowing the clinical history and by the seniority of the clinician — results that were to be expected. In reality, however, the pressures associated with the modern emergency department, including overcrowding and the 4-hour rule, make it inevitable that the ECG is usually taken before the patient is seen by a doctor and often interpreted by a junior doctor without the benefit of the history to inform the decision.

The authors did not determine the impact of incorrect diagnoses. If ventricular tachycardia is mistaken for supraventricular tachycardia, the consequences could be serious. *Editorial: A diagnosis of myocardial infarction is*

unreasonable investigations. In reality, if a doctor is unsure of the diagnosis, one hopes that he or she would be able to consult and collaborate with colleagues about the diagnosis, with knowledge of the patient history and clinical examination.

This study also makes one consider the risks and costs associated with the inappropriate use of investigations to screen for illness and to guide management, particularly if the test has a low sensitivity — like the ECG. For example, many a clinical dilemma has arisen when the result of a D-dimer test, done as part of a workup, is positive for a patient in whom a pulmonary embolism or deep vein thrombosis was not even part of the differential diagnosis.

Katelaris A. What influences clinical decision making? *Med J Aust*, Vol. 197, No. 3, p. 129, August 6, 2012.

"Clearly, we overestimate our ability to correctly deploy tests, interpret test results, and act appropriately on the results of clinical interactions and subsequent investigations."

monograph



There are growing opportunities for young doctors considering a career in cardiology, say leading cardiologists quoted in this issue's Career Overview, which looks at the risks of acute, chronic and procedural medicine on offer in the specialty (page C7). MJA Careers also profiles WA cardiologist, Dr Michelle Ammerer, who explains what it takes to make it in the often stressful world of interventional

cardiology (page C5). In Road Less Travelled, Melbourne anaesthetist and president of the Australian Doctors Orchestra, Dr Rowan Thomas, shares his love of music and medicine (page C6), and our Money and Practice section looks at the potential of social media tools, such as Twitter and Facebook, to link doctors with their profession (page C7) and other health professionals.

MJA 197 (3) - 6 August 2012

129

10

Just because the knife has
been removed does not mean
that the wound is healed.

11

Why is ELCN needed?

12

Efficacy

Simplicity

Cost

Cost effectiveness

13

Cost effectiveness

14

Testing Standard Medical Practices - NYTimes.com Page 1 of 3

The New York Times

August 19, 2012

Testing What We Think We Know
By H. GILBERT WELCH
Hanover, N.H.

BY 1990, many doctors were recommending hormone replacement therapy to healthy middle-aged women. But it was a problem, because the high-quality randomized trials of these standard practices had only just been completed? And that they showed that both did more harm than good? Justifiably furious, I'd say. Because these practices affected millions of Americans, they are locked in a tight competition for the greatest medical error on record.

The problem goes far beyond these two. The truth is that for a large part of medical practice, we don't know what works. But we pay for it anyway. Our annual per capita health care expenditure is now over \$8,000. Many countries pay half that – and enjoy similar, often better, outcomes. Isn't it time to learn which practices, in fact, improve our health, and which ones don't?

We don't know that is not working. That's why we have to start directing more money toward evaluating standard practices – all the tests and treatments that doctors are already providing.

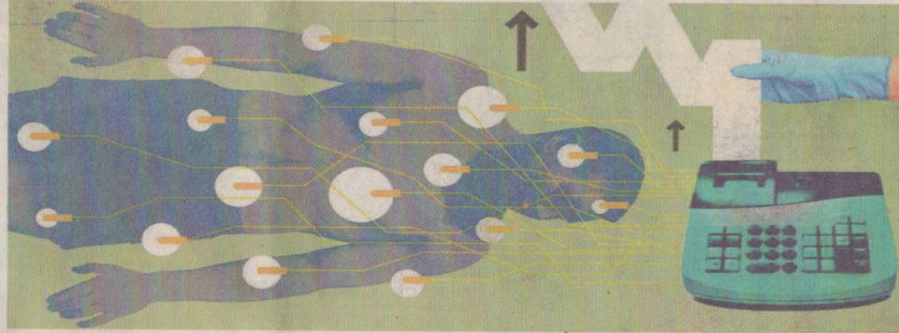
http://www.nytimes.com/2012/08/20/opinion/testing-standard-medical-practices.html?_r=... 8/20/2012

15

- “To find out, we more medical research. But not just any kind of medical research. Medical research is dominated by research on the new: new tests, new treatments, new disorders and new fads. But above all, it’s about new markets.”
- “We don’t need to find more things to spend money on; we need to figure out what’s being done now that is not working. That’s why we have to start directing more money toward evaluating standard practices-all the tests and treatments that doctors are already providing.”

WELL | Tara Parker-Pope

Overtreatment Is Taking a Harmful Toll



When it comes to medical care, many patients and doctors believe more is better.

But an epidemic of overtreatment — too many scans, too many blood tests, too many procedures — is costing the nation's health care system at least

\$210 billion a year, according to the Institute of Medicine, and taking a human toll in pain, emotional suffering, severe complications and even death.

"What people are not realizing is that sometimes the test poses harm," said Shannon Brownlee, acting director

of the health policy program at the New America Foundation and author of "Overtreated: Why Too Much Medicine Is Making Us Sicker and Poorer."

"Overmedicalization: How Too Much Medicine Is Making Us Sicker and Poorer."

The New York Times, August 28, 2012

more and more testing, and more and more invasive testing, and possibly even treatment for things that should be left well enough alone."

Have you experienced too much medicine? As part of The New York Times's online series The Agenda, I

asked readers to share their stories. More than 1,000 responded, with examples big and small.

Some complained that when they

had only recently ordered. Others told of being caught in a unending maze of testing and specialists who seem to forget the patient's original complaint. I heard from doctors and nurses, too — health professionals frustrated by a

Continued on Page 6

- "...an epidemic of overtreatment — too many scans, too many blood tests, too many procedures — is costing the nation's health care system at least \$210 billion a year, according to the Institute of Medicine, and taking a human toll in pain, emotional suffering, severe complications and even death."

- “What people are not realizing is that sometimes the test poses harm,’ said Shannon Brownlee, acting director of the health policy program at the New America Foundation and author of ‘Overtreated: Why Too Much Medicine Is Making Us Sicker and Poorer.’”
- “Sometimes the test leads you down a path, a therapeutic cascade, where you start to tumble downstream to more and more testing, and more and more invasive testing, and possibly even treatment for things that should be left well enough alone.”

19

Efficacy issues

20

Allostatic load or overload

“...the cumulative ‘wear and tear’ seen on body systems after prolonged or poorly regulated allostatic responses.”

23

Simplicity issues...

24

...for the patient

25

Oxford Journals Social Sciences The Journals of Gerontology: Series B Volume 67B, Issue 3 Pp. 279-288.

The Journals of Gerontology Series B: Psychological Sciences and Social Sciences
psychogerontology.oxfordjournals.org

J Gerontol B Psychol Sci Soc Sci (2012) 67B (3): 279-288. doi: 10.1093/geronb/gbr103
First published online: October 9, 2011

Health Behavior Change Following Chronic Illness in Middle and Later Life

Jason T. Newsom¹, Nathalie Huguet¹, Michael J. McCarthy², Pamela Ramage-Morin³,
Mark S. Kaplan¹, Julie Bernier³, Bentson H. McFarland⁴ and Jillian Oederink³

✉ Author Affiliations

Correspondence should be addressed to Jason T. Newsom, PhD, Institute on Aging, School of
Community Health, Portland State University, PO Box 751, Portland, OR 97207-0751. E-mail:
newsomj@pdx.edu.

Received August 30, 2010.
Accepted July 12, 2011.

Abstract

Newsom JT et al. Health behavior change following chronic illness in middle and later life, *J Gerontology Series B: Psychological Sciences and Social Issues*, Vol. 67B, No. 3, pp. 279-288, 2011.

Results. Patterns of behavior change following diagnosis indicated that the vast majority of individuals diagnosed with a new chronic condition did not adopt healthier behaviors. Smoking cessation among those with heart disease was the largest observed change, but only 40% of smokers quit. There were no significant increases in exercise for any health condition. Changes in alcohol consumption were small, with significant declines in excessive drinking and increases in abstinence for a few health conditions. Over the long term, individuals who made changes appeared to maintain those changes. Latent growth curve analyses up to 14 years after diagnosis showed no average long-term improvement in health behaviors.

Discussion. Results provide important new information on health behavior changes among those with chronic disease and suggest that intensive efforts are required to help initiate and maintain lifestyle improvements among this population.

Key words Chronic disease Disease management Health behavior Rehabilitation Secondary prevention

© The Author 2011. Published by Oxford University Press on behalf of The Gerontological Society of America. All rights reserved. For permissions, please e-mail: journals.permissions@oup.com.

26

More Older Adults With Multiple Problems - NYTimes.com
Page 1 of 3

The New York Times
The New Old Age
Caring and Coping

AUGUST 16, 2012, 1:59 PM
More Older Adults With Multiple Problems
By PAULA SPAN

I do look for good news, for promising trends for our elders and ourselves, honest. Whenever I can, I report on things like the potential health benefits of caregiving.

But there's a whole lot of the other kind of news, and - sorry! -- here's a bit more: The Centers for Disease Control and Prevention has reported stiff increases in the proportion of older community agency hypertensive those with hypertension and heart disease jumped up to 21 percent from 10 percent, and the prevalence of hypertension and cancer climbed to 11 percent from 8 percent.

These are statistically significant increases, found across all racial and ethnic groups examined - blacks, whites, Hispanics - and most income groups. By 2009-10, 45 percent of the respondents older than 65 had two or more chronic diseases, including stroke, emphysema, asthma and kidney disease. A decade earlier, only 37 percent did.

multiple diseases rose to 21 percent from 16 percent a decade earlier.

C.D.C. researchers speculated that widespread obesity could contribute to the change. So may the improved medical care that keeps people alive with multiple diseases that, in past generations, might have killed them.

Span P. More older adults with multiple problems, *The New York Times*, August 16, 2012.

"By 2009-10, 45 percent of the respondents older than 65 had two or more chronic diseases, including stroke, emphysema, asthma and kidney disease. A decade earlier, only 37 percent did."

"Over all, the study concluded, 'the vast majority of individuals do not make major lifestyle changes following diagnosis of a serious chronic disease, either in the short term or in the long term.'"

<http://newoldage.blogs.nytimes.com/2012/08/16/more-older-adults-with-multiple-problem...> 8/18/2012
27

August 16, 2012, 11:40 am
How Much Can Patients Learn in a 15-Minute Doctor Visit?
By PAULINE W. CHEN, M.D.

Built more like a former professional basketball player than an elementary schoolteacher nearing retirement, the patient dropped a bagful of prescription medications on the table in the examining room and fell back into a chair. He couldn't remember what most of them were for.

"I felt like I was in a Charlie Brown cartoon," he said, recounting the visit with a laugh. "All I can remember the doctor saying was, 'Waw, waw-waw, waw-waw.'"

This patient is far from alone in his difficulty absorbing a fire hose of advice. Thanks to some dazzling advances in preventive medicine and public health, doctors in almost every specialty of medicine now have a panoply of proven preventive recommendations to keep their patients from getting sick. And as the number of validated interventions has

mounting pressures from insurance companies and others to prove that they are delivering quality care, are simply scrambling to cover as many of the wellness recommendations as they can, piling on the dos and don'ts in what a colleague of mine once referred to as "the grand information dump."

In no other specialty is the problem as acute as in pediatrics, as two papers published this week in the journal *Pediatrics* underline. For children's doctors, the preventive pearls, which have been amassed in a

Chen PW. How much can patients learn in a 15-minute doctor visit?, *The New York Times*, August 16, 2012.

"I felt like I was in a Charlie Brown cartoon," he said, recounting the visit with a laugh. 'All I can remember the doctor saying was, 'Waw, waw-waw, waw-waw.'"

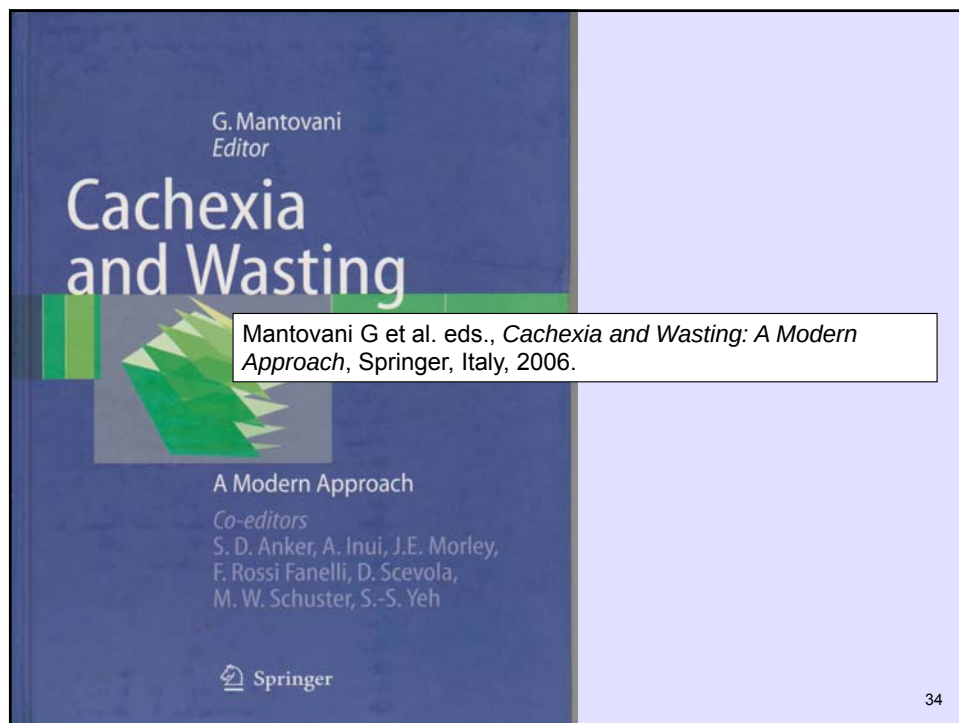
<http://newoldage.blogs.nytimes.com/2012/08/16/more-older-adults-with-multiple-problem...> 8/18/2012
28

29

30

The metabolic basis

33



- “Cachexia may well represent the devastating flip side of the tremendous achievements of modern medicine, as the incidence of cachexia is also a function of survival of chronic illness.”
- “Many diseases – which rapidly led to death only a few years ago – are now better controlled by new therapies. Even if we cannot cure and eradicate these diseases, their natural history has significantly increased by months and years. Although these new therapeutic strategies represent a remarkable advantage over the previous standards of care, **it is impossible to ignore the fact that many more patients are now facing the nutritional and metabolic consequences of prolonged immunological and hormonal challenges due to both the illness process itself and the aggressive therapies.**”

35

Current Treatment Options in Oncology (2010) 11:107–117
DOI 10.1007/s11564-010-0127-z

Integrative Oncology

Cancer Cachexia: Traditional Therapies and Novel Molecular Mechanism-Based Approaches to Treatment

Nagi B. Kumar, PhD, RD, FADA*

Aslam Kazi, PhD

Tiffany Smith, PhD

Theresa Crook, PhD

Daohai Yu, PhD

Richard R. Fiebert, PhD

Kiran Reddy, PhD

Sally Hastings, PhD

Martine Extenet, PhD

Lodovico Balducci, MD

Kyle Dalton, BS

Gerold Bepler, MD

Address

*Department of Population Sciences, H. Lee Moffitt Cancer Center & Research Institute at the University of South Florida College of Medicine, 12902 Magnolia Drive, Tampa, FL 33612, USA
E-mail: nagib.kumar@moffitt.org

© The Author(s) 2010

Disclaimer statement

“The complex syndrome of cancer cachexia (CC) that occurs in 50% to 80% of cancer patients has been identified as an independent predictor of shorter survival and increased risk of treatment failure and toxicity, contributing to mortality and morbidity in this population.”

Although the etiology of CC is poorly understood, studies have proposed that NF-κB is upregulated in CC, modulating immune and inflammatory responses induce the

36

European Journal of Cancer Care

Original article

An exploration of the experience of cancer cachexia: what patients and their families want from healthcare professionals

J. REID, RGN, DIP, BSC (HONS), PGCE, MSc, PhD, LECTURER IN CANCER NURSING, Nursing and Midwifery Research Unit, School of Nursing and Midwifery, Queen's University, Belfast, H.P. MCKENNA, CBE, PhD, BSC (HONS), RMN, RGN, RNT, DIPN (LOND), ADVISED, FEN FROES FRANK, FRGN, DEAN, Faculty of Life and Health Science, Institute of Nursing Research, University of Ulster, Coleraine, Co. Londonderry, D. FITZSIMMONS, RGN, BSC, PhD, SPENC, SENIOR MANAGER/HEAD, Belfast City Hospital, School of Nursing Research

Reid J et al. An exploration of the experience of cancer cachexia: What patients and their families want from healthcare professionals, *Eur J Cancer Care*, Vol. 19, pp. 682-689, 2010.

REID J., 682-689
An exploration of the experience of cancer cachexia

The aim of this paper is to investigate the perceptions of patients and family members with regard to care received for cancer cachexia. A qualitative study recruited 27 participants, of which 15 were patients with advanced cancer who had primary cachexia and 12 were family members. Participants were recruited from a regional cancer centre in the UK. All participants took part in a domiciliary interview, which was transcribed verbatim for analysis. A major finding from analysis was 'lack of response from health care professionals' in relation to cancer cachexia management. This finding illuminated that patients and their family members wanted three things from healthcare professionals. They wanted their profound weight loss acknowledged, they wanted information about it and why it was happening and they wanted interventions to deal with it. This paper provides powerful messages for healthcare professionals and highlights the needs of patients and their family regarding cancer cachexia management. Patients and their families want this problem addressed

"While cachexia is prevalent in cancer, it is not exclusive to it and is seen in many conditions including AIDS, congestive heart failure, rheumatoid arthritis and Crohn's disease"

Correspondence address: Joanne Reid, Nursing and Midwifery Research Unit, School of Nursing and Midwifery, Queen's University Belfast, 10 Malone Road, Belfast, BT9 5BN, UK (e-mail: j.reid@qub.ac.uk)

Funding: the R&D office of the DHPSS of Northern Ireland provided a PhD Training Fellowship for this study to be undertaken.

Accepted 21 January 2009
DOI: 10.1111/j.1365-2534.2009.03124.x

European Journal of Cancer Care, 2010, 19, 682-689

© 2009 The Authors
Journal compilation © 2009 Blackwell Publishing Ltd

weight loss, muscle wasting, anorexia, early satiety, anaemia, anaemia and oedema (Dahle & Fearon 2004). The term cachexia originates from the combination of two Greek words *kakos* meaning 'bad' and *hoxis* meaning 'condition'. While cachexia is prevalent in cancer, it is not exclusive to it and is seen in many conditions including AIDS, congestive cardiac failure, rheumatoid arthritis and Chron's disease (Tisdale 2003). According to international

37

- "Currently in cancer cachexia management, no clinical intervention has been shown to significantly impact on morbidity and mortality, progress functional status or improve quality of life."
- "Indeed, practice guidelines detailing the most advantageous therapeutic treatment modality for cancer cachexia have yet to be determined."
- "This may help explain the silent response from healthcare professionals, as perceived by participants within the present study."

Why is it needed: Beyond biochemistry and physiology

- Cost effective – Does not rely heavily on functional lab tests or massive supplemental protocols.
- Time effective – Its back to basics approach is very time efficient.
- Conceptually simple – Easier to explain to patients, which improves compliance.

39

What is it from a very basic,
“in the trenches,” clinical
standpoint?

40

Underlying hypotheses of Entry Level Clinical Nutrition:

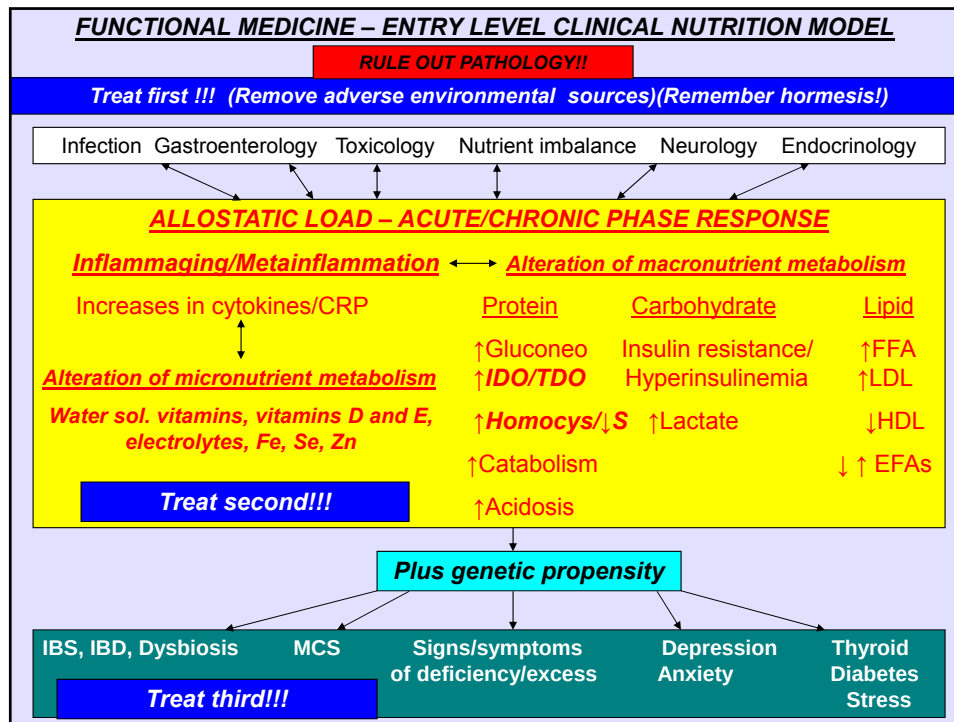
- Chief complaints in chronically ill patients are not diseases but responses that have gone on too long (Allostatic load).
- The metabolic imbalances that combine to form this response have been well defined by critical care nutritionists.

41

Entry Level Clinical Nutrition:

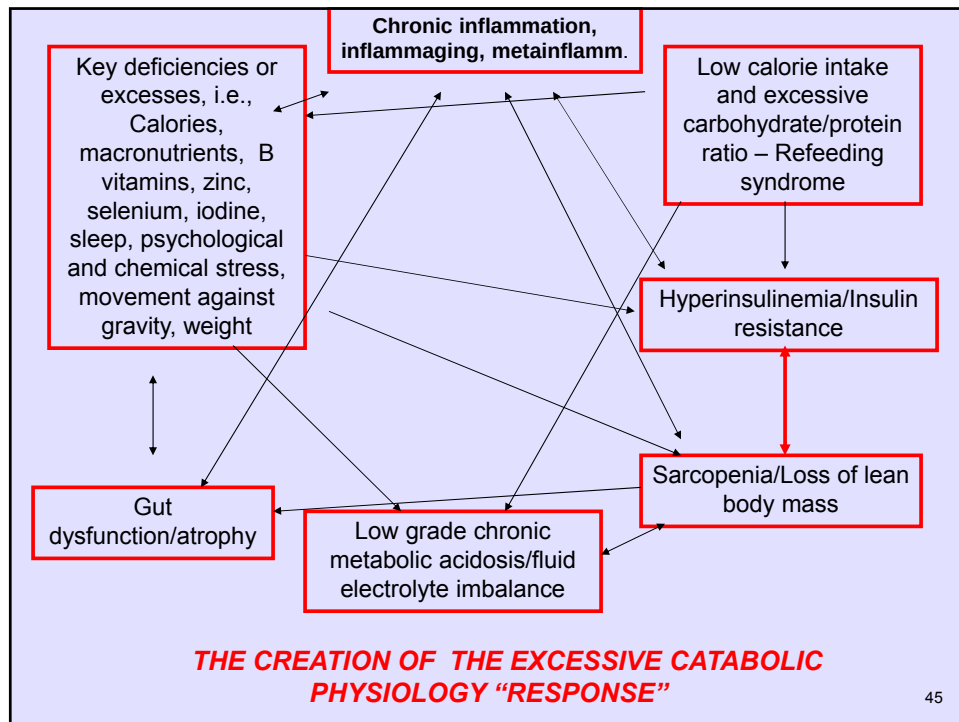
A new model of functional
medicine that incorporates
allostatic load

42



Key metabolic imbalances seen with allostatic load

- Metabolic acidosis
- Loss of lean body mass (sarcopenia)
- Insulin resistance
- Inflamm-aging (Increased innate immunity and decreased adaptive immunity)
- Suboptimal caloric intake and carbohydrate:protein ratio (Refeeding syndrome)
- Gastrointestinal dysfunction/gut atrophy
- Excess or deficiencies of key macro and micronutrients such as protein, zinc, selenium, and vitamin D, plus sleep, movement, companionship, etc.



Immunological Reviews

Amy R. Johnson
J. Justin Milner
Liza Makowski

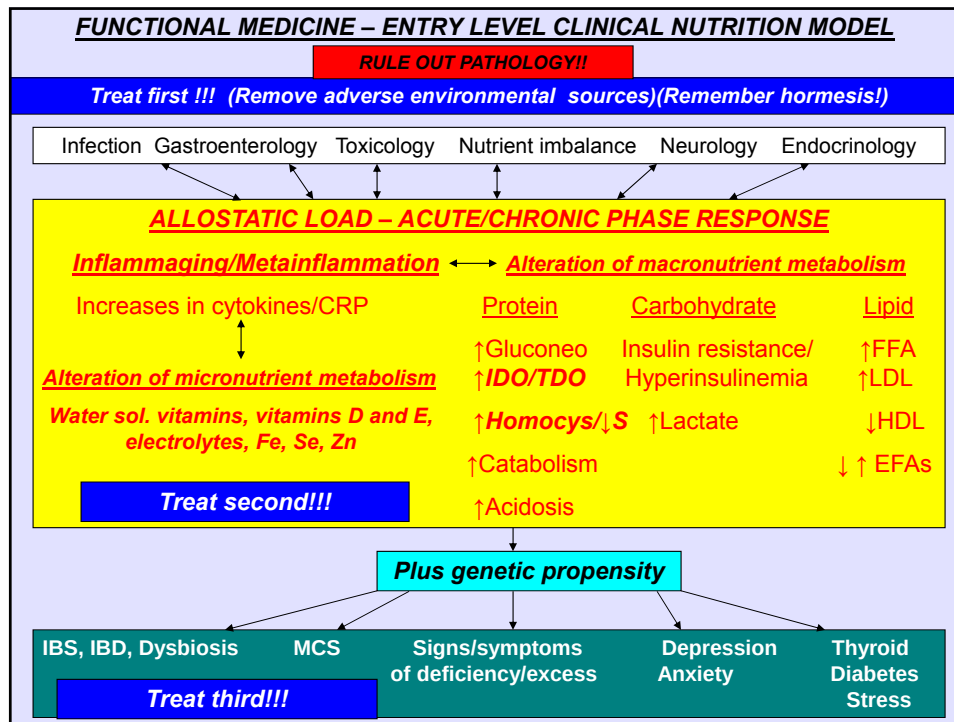
The inflammation highway:
metabolism accelerates
inflammatory traffic in obesity

Johnson AR et al. The inflammation highway: metabolism accelerates inflammatory traffic in obesity, *Immunol Rev*, Vol. 249, pp. 218-238, 2012.

“...obesity is a state of low-grade, chronic inflammation that promotes the development of insulin resistance and diabetes. Ironically, the formation of systemic and/or local, tissue-specific insulin resistance upon inflammatory cell activation may actually be a protective mechanism that co-evolved to repartition energy sources within the body during times of stress during infection.

218

46



Specifically, how does it work?

First appointment procedure

49

- At the time the patient makes the first appointment, request that the following be submitted before the first appointment (This will “weed out” those who are serious about making changes to improve their health versus those who are looking for “magic pills”):
 - Any lab test that has been performed within the last two years.
 - A written history of the chief complaint.
 - A three day dietary history. Specifically request “everything that goes into your mouth for three days” as the patient will often neglect to include important items such as liquids, chewing gum, breath mints, snack foods, etc. if the request only states “a three day dietary history.” Please remember that many if not most patients today are creating most of the diet related metabolic imbalances at snack time, not at meal time.

50

- Review the above before the first appointment to gain familiarity so that repoire can be created as soon as possible upon meeting the patient. Upon meeting the patient, make sure you indicate that you read this information by thanking the patient for doing such an excellent job in providing it.
- Upon first meeting the patient, examine the patient visually. Take mental note of any of the following:
 - Look for any signs of loss of muscle mass such as “floppy” triceps, “saggy” gluteal muscles, and overall muscle definition in arms and legs.
 - Look at the face and any other exposed areas to see skin tone. Is it smooth and supple with healthy coloring or wrinkled, hard, shiny, or pasty?
 - Look at the posture and gait. Does it suggest confidence, fear, anger, resentment, or despair?

51

- Take a detailed history by asking key questions (See enclosed questionnaire). It is strongly advised not to use history or symptom “forms” that the patient fills out for the following reasons:
 - Truly understanding the patient’s concerns, fears, desires, etc. and establishing a caring and friendly relationship is probably more important than gaining factual information in terms of successful resolution of chief complaints.
 - Key information that may be most important to understanding how the patient became chronically ill is often sensitive and potentially embarrassing. Very rarely will patients indicate this information on a form.
 - Patients often forget key information or do not completely understand the questions.
 - Every patient has a story to tell. Odds of resolution of chief complaints increase dramatically if the patient is allowed to tell this story even though you have heard variations of this story from many patients many times.
 - Patients generally dislike filling out long detailed forms, especially since the practitioners seen before you rarely indicated to the patient that these forms were carefully and diligently read. In turn, starting out with several lengthy forms can often lead to the formation of negative attitudes towards you even before the critical first encounter.

52

- Get body weight and analysis of body composition using bioelectric impedance scale.
- Perform grip strength test.
- Perform gait speed test.
- Perform zinc taste test.
- Give roll of pH paper and explain first morning urine pH procedure (Measure first morning urine pH upon rising for five days). If the patient indicates that he or she wakes up several times during the night, urine pH should be measured at the time the patient arises to start the day's activities. ***Make sure you charge for the roll of pH paper as this will help "weed out" those who are serious about working with you.***

53

- Provide a basic explanation of why the first appointment was conducted in the manner just described and a preliminary hypothesis concerning the cause of the patient's chief complaints and how they will be addressed. This preliminary description should include the following:
 - A general overview of what will be required of the patient in terms of lifestyle modifications (Be prepared to compromise with the patient, if possible).
 - Time commitments.
 - Cost, including supplements and future laboratory testing.
 - A disclaimer that this explanation is preliminary and will be followed by a formal presentation of findings and treatment plan at the next appointment.
- **The duration of the first appointment should be approximately 1.5 – 2.0 hours in length. Make sure you charge an appropriate fee for this time.**

54

Clinical indicators for each metabolic category

55

Low grade chronic metabolic acidosis/fluid electrolyte imbalance

- First morning urine pH below 6.4 (Should be between 6.4 and 7.0).
- Elevated or depressed serum potassium (Should be close to 4.5 mmol/L).
- High or high normal serum sodium and chloride.
- High or high normal BUN with normal creatinine.
- Low or low normal CO₂.

56

Sarcopenia/Loss of lean body mass

- Bioelectric impedance analysis (BIA) to measure percent body fat and lean body mass.
- Grip strength (Jamar Dynamometer)
- Visual appearance
- Gait speed
- Serum or bloodspot amino acids
- Daily protein intake (For most patients it should be from 1.2 – 1.5 g/kg/d).
- Level of weight bearing exercise

57

Insulin resistance

- Serum glucose above 90 mg/dL
- Cravings – usually carbohydrate-based.
- Glycosylated hemoglobin.

58

Suboptimal caloric intake and carbohydrate:protein ratio (Refeeding syndrome)

- Skipping meals and then binging on carbohydrates.
- Low or low normal serum potassium (Below 4.0 mmol/L).
- Low or low normal serum phosphate.
- Low serum magnesium

59

Inflamm-aging (Increased innate immunity and decreased adaptive immunity)

- Autoimmune signs and symptoms plus frequent colds and flu.
- Elevated C-reactive protein.
Metabolically, virtually none should be present.
- Low normal neutrophils and high normal lymphocytes.

60

Inflamm-aging (Increased innate immunity and decreased adaptive immunity)

- Rule out food sensitivities – Clinical experience suggests that simple elimination of commonly ingested foods for 10-14 days will be the most cost effective analytical method.
- If simple elimination/challenge methods are ineffective or not possible due to compliance issues, consider lab tests such as ALCAT (Keep in mind, though, that all food allergy testing technologies are expensive and yield a fair amount of false positives and false negatives).

61

Gastrointestinal dysfunction/gut atrophy

- Signs and symptoms
- Eating fast and eating under stress

62

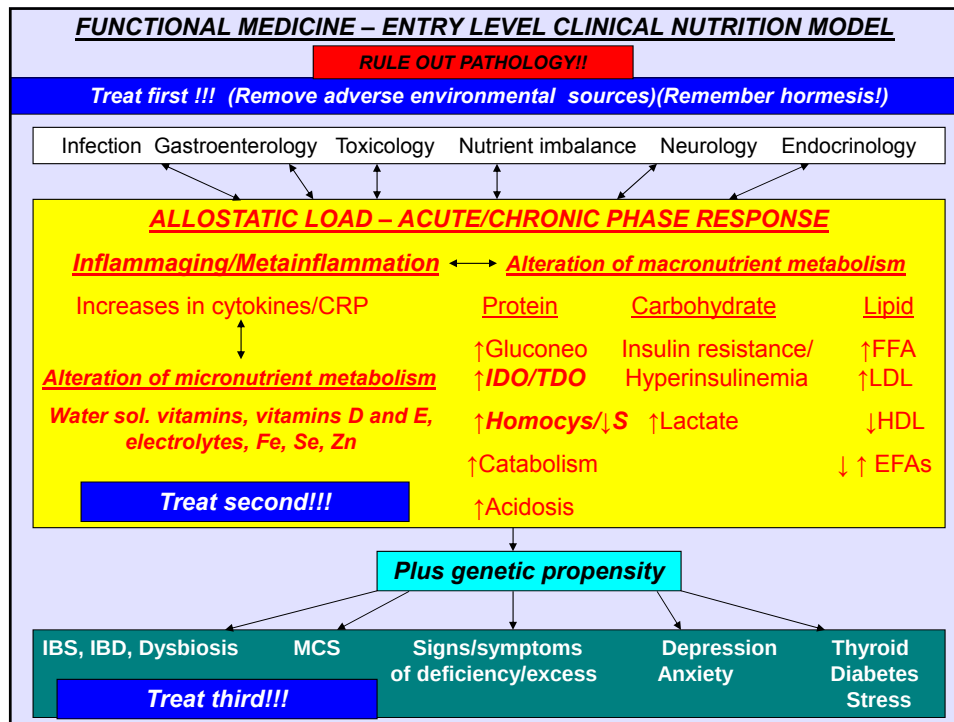
Excess or deficiencies of key factors

- Calories and macronutrients
- Vitamin D – 25(OH)D below 30 ng/mL
- Zinc – zinc taste test
- Selenium – elevated RDW
- Iodine
- Sleep
- Movement
- Companionship
- ***Usual daily stressors***

63

Treatment considerations

64



Please keep the numerous metabolic interactions in mind. For example, correction of low grade, chronic metabolic acidosis will have a profound impact on insulin resistance and inflammaging.

Low grade chronic metabolic acidosis/fluid electrolyte imbalance

- Low grade, chronic metabolic acidosis has many causes (Lack of sleep, medications, over exercise, major pathology, i.e. renal disorders, autoimmune conditions). However, for the average American ingesting the average American diet, a major contributing factor is a acid-based, low potassium/magnesium diet. In this situation the following is recommended if the first morning urinary pH is below 6.4:

67

Low grade chronic metabolic acidosis/fluid electrolyte imbalance

One night #1 do one of the following:

1) Ingest 1 K Alkaline + Mg (Moss Nutrition) before bedtime

Or

2) Ingest 1 K Alkaline and 1 Mg Glycinate (Moss Nutrition) before bedtime

68

Low grade chronic metabolic acidosis/fluid electrolyte imbalance

- Check the first morning urinary pH the next morning.
- If it is still below 6.4, increase the dose by one at bedtime that day.
- Continue increasing each day until the first morning urinary pH is at least 6.4.

69

Low grade chronic metabolic acidosis/fluid electrolyte imbalance

- Clinical experience suggests that if the first morning urinary pH is not at least 6.4 by day 6, other factors besides diet are contributing to the low grade, chronic metabolic acidosis.
- In this situation, review all diagnostic information to determine the contributing factor.

70

Sarcopenia/Loss of lean body mass

- Institute a ***patient specific*** exercise program that incorporates both weight bearing and aerobic exercise.
- Determine optimal caloric intake (usually 2000-2500 kcal per day – with the exception of reactive hypoglycemia/refeeding syndrome).

71

Sarcopenia/Loss of lean body mass

- Calculate protein intake (usually 1.2 – 1.5 g per kilogram body weight per day).
- Correct diet to get as close the optimal caloric and protein intake as possible.
- If optimal levels cannot be attained via diet alone, consider use of a meal supplement drink such as Select Meal (Moss Nutrition).
- If drinks cannot be tolerated or significant GI dysfunction exists, consider use of a free form amino acid supplement.
- Research suggests that increases in lean body mass will be more effective with a supplement containing both protein and carbohydrate.

72

Sarcopenia/Loss of lean body mass

Monitor progress using the following:

- BIA testing
- Grip strength
- Gait speed

73

Insulin resistance

- Optimize overall dietary quality and protein/carbohydrate ratio.
- **Place particular emphasis on liquids**
- **Create a “comfort food” allowance**
- Optimize rate of food ingestion
- Advise patient to always eat in a relaxed, focused manner (Do not eat standing up, in a car, or when doing other activities).
- Females, in particular, should always ingest meals with at least one like-minded companion.
- Consider the use of a glycemic supplement such as Metabolic Synergy (DFH).
- Credible anecdotal reports suggest that reduction of cravings is the best indicator of progress.

74

Suboptimal caloric intake and carbohydrate:protein ratio (Refeeding syndrome)

- Same recommendations as with correction of insulin resistance except add the following:
- Increase caloric intake slowly, often starting with as little as 1000-1500 kcal per day.
- If serum potassium is below 4.0 mmol/L, supplement 1-2 K Alkaline + Mg or 1-2 each of K Alkaline and Mg Glycinate per day.
- Consider use of Ultra B Complex (BioGenesis) to supply thiamin.
- Credible anecdotal reports suggest that reduction of cravings is the best indicator of progress.

75

Inflamm-aging (Increased innate immunity and decreased adaptive immunity)

- Institute a diet that consists of as few **patient specific** food allergens as possible.
- Keep in mind that correction of virtually all the metabolic issues mentioned will have an optimizing effect on inflamm-aging.
- Consider use of a quality fish oil product and an anti-inflammatory formulation such as Bio-Inflammatory Caps (BioGenesis).
- Reduction of C-reactive protein, optimization of the white cell differential, and fewer episodes of colds and flu and excellent indicators of progress.

76

Gastrointestinal dysfunction/gut atrophy

- Optimize overall dietary quality and protein/carbohydrate ratio.
- **Place particular emphasis on liquids**
- **Create a “comfort food” allowance**
- Optimize rate of food ingestion
- Advise patient to always eat in a relaxed, focused manner (Do not eat standing up, in a car, or when doing other activities).
- Females, in particular, should always ingest meals with at least one like-minded companion.

77

Gastrointestinal dysfunction/gut atrophy

- Calculate protein intake (usually 1.2 – 1.5 g per kilogram body weight per day).
- Correct diet to get as close the optimal caloric and protein intake as possible.
- If optimal levels cannot be attained via diet alone, consider use of a meal supplement drink such as Select Meal (Moss Nutrition).
- If drinks cannot be tolerated or significant GI dysfunction exists, consider use of a free form amino acid supplement.

78

Gastrointestinal dysfunction/gut atrophy

Consider use of the following digestive aids:

- Betaine HCl (DFH)
- GastroSelect (Moss Nutrition)
- GI Select I and II (Moss Nutrition)

79

Excess or deficiencies of key factors

Address the following:

- Sleep
- Movement
- Companionship
- **Usual daily stressors**
- **Anything else in the patient's life that appears to be in excess or deficiency**

Optimize diet and supplement the following as needed

- Calories and macronutrients
- Vitamin D (Moss Nutrition) – 2000 IU/day (Monitor with serum 25 (OH) D levels)
- Zinc Supreme (DFH) - 20 – 30 mg/day (Monitor with zinc taste test)
- Selenium – 200 mcg/day (Monitor with serum RDW)
- Iosol – Start with 1 drop (1.8 mg) per day – Increase as needed

80

Some final, big picture thoughts

81

Major clinical advantages of Entry Level Clinical Nutrition

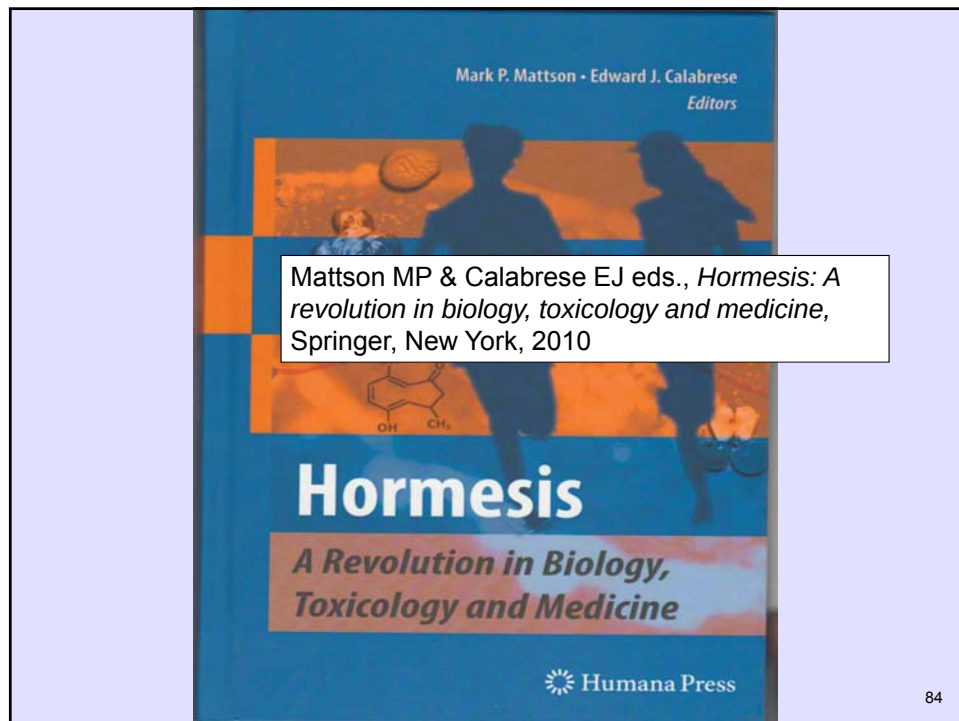
- Metabolic basis and efficacy is supported by a large volume of clinical intervention studies performed on humans.
- Diagnostic modalities are simple and inexpensive
- Diagnostic and treatment modalities are designed with patient compliance in mind.
- A total inventory of less than 20 supplements is employed.

82

“The world is full of obvious things which nobody by any chance ever observes...”

Arthur Conan Doyle
The Hound of Baskervilles

83



84

