Creating Health
The Best Treatment For Chronic Disease

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Disclosures

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• Development of chronic disease
• My story
• Our research
• Therapeutic Lifestyle Clinic

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DNA

Diet, lifestyle

Forager-Hunter 500,000 BC
Main Cause of death
Infection, trauma
Mean age 30s
45% mortality before age 15

Forager-Hunter 2007
Traditional diet, no medical care
Main cause of death
Infection, trauma
Often live into 60s and 80s

Forager-Hunter to Farmer -10,000 BC
↑ fertility, infection; ↓ height
**Industrial Revolution 1800s**
- ↑ sugar, white flour; ↓ breast feeding
- ↑ obesity, heart disease, diabetes

**After World War II 1950s**
- ↑ sugar, ↑ vegetable oils, ↑ HFCS, ↑ Trans fats
- ↑ ↑ obesity, heart disease, diabetes

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**Chronic Medical Diseases**

**Millions of Americans Affected**
- Overweight/Obese
  - 69% of us - 220 M
- Diabetes 29 M
- Autoimmune 75 Million
  - Diagnosed 25 Million
  - Symptoms + Autoantibodies 50 Million

1 in 3 children will become severely obese and diabetic
A Frightening Trend*


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**Multiple Sclerosis Genetic Risk**

- One parent 3%
- Sibling – 5%
- Two parents 30%

Epigenetics

- Environmental factors turn genes ‘on’ and ‘off’ changing how our cells run the chemistry of life and the Phenotype or shape and performance of organism
- WITHOUT changing the DNA sequence!

Phenotype

“Wild type”
Healthy
Disease
Resistant

Epigenetic Marks

Are passed on to our
- Children
- Grandchildren
- Great grandchildren
- Great great grandchildren
Food Is the Most Powerful Epigenetic Factor

Americans ARE Starving
% >2 yrs old intake below Recommended Daily Allowance

<table>
<thead>
<tr>
<th>Vitamin &amp; Nutrient</th>
<th>Percentage Below RDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omega-3</td>
<td>10.00%</td>
</tr>
<tr>
<td>Iodine</td>
<td>20.00%</td>
</tr>
<tr>
<td>Zinc</td>
<td>30.00%</td>
</tr>
<tr>
<td>Magnesium</td>
<td>40.00%</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>50.00%</td>
</tr>
<tr>
<td>Pyridoxine (B6)</td>
<td>60.00%</td>
</tr>
<tr>
<td>Iron</td>
<td>70.00%</td>
</tr>
<tr>
<td>Thiamin (B1)</td>
<td>80.00%</td>
</tr>
<tr>
<td>Riboflavin (B2)</td>
<td>90.00%</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>100.00%</td>
</tr>
<tr>
<td>Niacin (B3)</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Essential Nutrient Insufficiencies linked with Top Causes of Death in the U.S.

- Alzheimer’s: Mg, Se, Cu, Vit. D
- Cancers: Mg, Zn, Se, Cu, Vit. D
- Chronic Lung diseases: Mg, Se, Vit. D
- Diabetes Mellitus: Ca, Mg, Zn, Se, Cr, Vit. D
- Heart Disease: Ca, Mg, Zn, Se, K, Cr, Cu, Vit. D
- Kidney disease: Zn, Se, Vit. D
- Liver disease: Zn, Se
- Hypertension: Ca, Mg, Zn, Se, K, Cr, Cu, Vit. D

KEY
Mg=magnesium, Se=selenium, Zn=zinc, Cu=copper, Ca=calcium, Cr=chromium, K=potassium, Vit. D=vitamin D

Sugar intake per capita in the United Kingdom from 1700 to 1978 (30; ●) and in the United States from 1975 to 2000 (32; ○) is compared with obesity rates in the United States in non-Hispanic white men aged 60–69 y (17; •).

Eighty Year Decline in Mineral Content in an Apple

<table>
<thead>
<tr>
<th>Mineral</th>
<th>1914</th>
<th>1963</th>
<th>1992</th>
<th>% CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>13.5 mg</td>
<td>7.0 mg</td>
<td>7.00 mg</td>
<td>-48%</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>45.2 mg</td>
<td>10.0 mg</td>
<td>7.0 mg</td>
<td>-86%</td>
</tr>
<tr>
<td>Iron</td>
<td>4.6 mg</td>
<td>0.3 mg</td>
<td>0.18 mg</td>
<td>-96%</td>
</tr>
<tr>
<td>Magnesium</td>
<td>28.9 mg</td>
<td>8.0 mg</td>
<td>5.0 mg</td>
<td>-82%</td>
</tr>
</tbody>
</table>

Decline in Micronutrients In Chicken and Beef

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium  mg</td>
<td>10.0</td>
<td>8.0</td>
<td>-20%</td>
<td>12.0</td>
<td>10.0</td>
<td>-17%</td>
</tr>
<tr>
<td>Iron mg</td>
<td>2.7</td>
<td>1.7</td>
<td>-36%</td>
<td>1.3</td>
<td>1.0</td>
<td>-21%</td>
</tr>
<tr>
<td>Vitamin A IU</td>
<td>40.0</td>
<td>0.0</td>
<td>-100%</td>
<td>150.0</td>
<td>45.0</td>
<td>-70%</td>
</tr>
<tr>
<td>Vitamin B1 mg</td>
<td>0.08</td>
<td>0.04</td>
<td>-50%</td>
<td>0.10</td>
<td>0.07</td>
<td>-30%</td>
</tr>
</tbody>
</table>

Gluten
Gluten sensitivity is characterised by abnormal immune response to gluten in genetically susceptible individuals. This disorder is often accompanied by neurological dysfunction. In some individuals, gluten sensitivity was shown to manifest solely with neurological dysfunction. Also 90% of gluten sensitive individuals have no GI symptoms.

Hadjivassiliou M


Figure 2: MRI in four patients with gluten encephalopathy. The extent and variability of white mater abnormalities caused by gluten sensitivity can be seen in these four patients (A-D). A and C show diffuse white matter changes, whereas B and D show more focal changes.

Marios Hadjivassiliou, David Sanders, Richard A. Grünewald, Nicola Woodroofe, Sabrina Boscolo, Daniel Aeschli...

Gluten sensitivity: from gut to brain
The Lancet Neurology Volume 9, Issue 3 2010 318-330

Sugar turns genes ‘on’ and ‘off’ creating an inflamed disease prone body

Increased risk of High Blood Pressure, Obesity, Diabetes, Dementia, Heart Disease, Mental Health Problems, Neurological Problems, Autoimmunity and Cancer

Since World War II
- >80,000 chemicals have been registered with the E.P.A. due to toxic effects
200+ Chemicals Found In Cord Blood/Breast milk

- Herbicides
- Pesticides
- Dioxins
- Plastics
- Solvents
- Heavy metals: lead, mercury, arsenic


Toxins turn genes ‘on’ and ‘off’ Increasing the risk of developing

<table>
<thead>
<tr>
<th>Brain Issues</th>
<th>Chronic Medical Diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autoimmunity</td>
<td>Allergy/ Asthma</td>
</tr>
<tr>
<td>Autism spectrum</td>
<td>Autoimmunity</td>
</tr>
<tr>
<td>Behavior</td>
<td>Anemia</td>
</tr>
<tr>
<td>Developmental delay</td>
<td>Cancer</td>
</tr>
<tr>
<td>Attention deficient/Hyperactivity disorder</td>
<td>Chronic fatigue</td>
</tr>
<tr>
<td>Neuropathy</td>
<td>Diabetes</td>
</tr>
<tr>
<td>Parkinson’s</td>
<td>Early Puberty/Infertility</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>Erectile dysfunction</td>
</tr>
<tr>
<td></td>
<td>Heart disease</td>
</tr>
<tr>
<td></td>
<td>Hypertension</td>
</tr>
<tr>
<td></td>
<td>Kidney</td>
</tr>
<tr>
<td></td>
<td>Osteoporosis</td>
</tr>
</tbody>
</table>

Toxins and Disease Associations Sources

- Health And Toxicology Specialized Information Services – http://sis.nlm.nih.gov/enviro.html
- National Pesticide Information Center – http://npic.orst.edu/rmpp.htm

Physical Activity

Women: 2-3 Miles/ Day  Men 6-9 Miles/ Day
The most sedentary individuals had higher body mass index, greater waist circumference, elevated blood pressure, worse lipid profiles, higher C-reactive protein level, and more insulin resistance.

Recent studies provide clear and convincing evidence that psychosocial factors contribute significantly to the pathogenesis of coronary artery disease: 5 domains: (1) depression, (2) anxiety, (3) personality factors, (4) social isolation, and (5) chronic life stress.
36 Key Micronutrients

Neuroprotection Course


Epigenetic Environmental Factors

- Diet quality
- Toxins- including tobacco
- Physical activity
- Stress
- Vitamin D
- Family life
- Hormonal balance
- Infection
- Microbiome alteration
- Trauma – physical
- Trauma -psychological
- Sleep quality
- Social networks
Leafy Greens

Colored Foods

Sulfer-Rich Foods

Grass-fed Meats, Organ Meats, and Wild Fish
Seaweed
One of the best natural sources of iodine

Reduce Toxin Exposure

Improve Elimination of Toxins

3
Greens

3
Colored

3
Sulfur
**Improve Elimination of Lead and Mercury**

**Nutritional Adequacy: % RDA Provided**

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Wahl's Diet</th>
<th>US Diet</th>
</tr>
</thead>
<tbody>
<tr>
<td>B12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riboflavin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inositol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niacin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiamin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Folate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyridoxine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin D</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Electrical Stimulation of Muscles**

**Meditation**
9 Months of Paleo Diet, Exercise, NMES, Stress Management, Learning

http://www.casesjournal.com/content/2/1/7601

Modified Paleoithic Diet

Home Exercise Program
+ Neuromuscular Electrical stimulation

Multimodal Intervention

Vitamins & Nutritional supplements

Stress Management
### Study Diet

<table>
<thead>
<tr>
<th>Food</th>
<th>Instruction</th>
<th>Servings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green leafy vegetables</td>
<td>Recommended*</td>
<td>3 cups cooked/6 cups raw = 3 servings</td>
</tr>
<tr>
<td>Sulfur-rich vegetables</td>
<td>Recommended*</td>
<td>3 cups raw or cooked = 3 servings</td>
</tr>
<tr>
<td>Intensely colored fruits or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vegetables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Omega-3 oils</td>
<td>Encouraged</td>
<td>2 tablespoons</td>
</tr>
<tr>
<td>Animal protein</td>
<td>Encouraged</td>
<td>4 ounces or more</td>
</tr>
<tr>
<td>Gluten-containing grain</td>
<td>Excluded</td>
<td></td>
</tr>
<tr>
<td>Dairy</td>
<td>Excluded</td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td>Excluded</td>
<td></td>
</tr>
</tbody>
</table>

### Daily - Eat 9 Cups Vegetables/Fruit

- **3 Greens**
- **3 Colored**
- **3 Sulfur**

### Methyl folate, methyl B12, EFAs, Vitamin D


### Meditation

## Stretching Exercises

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastro-soleus</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>Hamstring</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>Quadriceps</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>Erector spinae</td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
</tbody>
</table>

## Strengthening Exercises

- Electrical Stimulation of Muscles builds muscle mass.

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**A Multimodal Intervention for Patients with Secondary Progressive Multiple Sclerosis: Feasibility and Effect on Fatigue**

**Background:** Multiple sclerosis is an autoimmune disease influenced by environmental factors.

**Objective:** The feasibility of a multimodal intervention and its effect on perceived fatigue in patients with secondary progressive multiple sclerosis were assessed.

**Designing:** This was a single-arm, open-label intervention study in an outpatient setting.

**Intervention:** A multimodal intervention including a modified paleolithic diet with supplements, stretching exercises with electrical stimulation of trunk and lower limb muscles, meditation, and massage was used.

**Outcome measures:** Adherence to each component of the intervention was calculated using daily logs. Side-effects were assessed from a monthly questionnaire and blood analyses. Fatigue was assessed using the Fatigue Severity Scale (FSS). Data were collected at baseline and months 1, 2, 3, 6, 9, and 12.

**Results:** Ten (80%) of 13 subjects who were enrolled in a 2-week run-in phase were eligible to continue in the 12-month main study. Of these 10 subjects, 8 completed the study and 6 subjects fully adhered to the study.
Side effect – Overweight and obese subjects lost weight and got to a healthy weight

Fatigue Severity Scale (7 -1, 1=no fatigue) decreased by 2.38 from 5.70 at baseline to 3.32 at 12 months (p=0.0008).

SF-36 energy, SF-36 general health and FSS-9 scores at baseline, and 3, 6, 9 and 12 months after the intervention and correlation of mean SF-36 energy and mean general health scores with mean FSS-9 scores at baseline, 3, 6, 9 and 12 months. r= Pearson’s correlation coefficient. Symbol and error bars= Mean ± SE. Significant difference from baseline **p<0.0005, *p<0.05.
F-Müller¹, J Poettgen¹, F Broemel¹, A Neuhass¹, M Daumer²
and C Hess²

Abstract

Objective: To assess the effect of modafinil, a wakefulness-promoting antifungal monamine, on fatigue and neuropsychological measures in patients with multiple sclerosis.

Methods: Multiple sclerosis (MS) patients with a baseline score of >4 on the Fatigue Severity Scale (FSS) and an Expanded Disability Status Scale score of <6.5 on the Baseline examination showed improved scores on the Fatigue Severity Scale (FSS) and the Sleepiness Scale (ESS).

Results: The study included 21 MS patients. Baseline measures showed improvements in all assays. The study included 21 MS patients. Baseline measures showed improvements in all assays.

Conclusions: Modafinil significantly reduced fatigue severity in patients with multiple sclerosis, as assessed by the Fatigue Severity Scale (FSS) and the Sleepiness Scale (ESS).

Subject 3 - Baseline and 12 Month Walk

Subject 11 - Baseline and 3 Month Walk
Subject 11- Jogging & Jumping at 6 months

Factors Associated With Success

- Family intervention / support
- Less disability
- Shorter disease duration
- Intervention Dose

New Directions

Ketosis

Beyond weight loss: a review of the therapeutic uses of very-low-carbohydrate (ketogenic) diets.

- Very-low-carbohydrate diets or ketogenic diets have been in use since the 1920s as a therapy for epilepsy and can, in some cases, completely remove the need for medication.
- Therapeutic potential for diabetes, polycystic ovary syndrome, acne, neurological diseases, cancer.

Ketogenic Diet Studies

- Seizures
- Neurodegenerative
- Psychiatric
- Obesity, metabolic syndrome
- PCOS

<table>
<thead>
<tr>
<th>Ketogenic</th>
<th>Dairy Fat</th>
<th>Medium Chain Trigs MCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fat</td>
<td>90%</td>
<td>60-70%</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>5% (25 gm)</td>
<td>15-20% (60 – 80 gm)</td>
</tr>
<tr>
<td>Protein</td>
<td>5%</td>
<td>15-20%</td>
</tr>
</tbody>
</table>

TLC -Group Classes

- One hour introduction to class no labs
- Three hour intake – timeline / matrix with lab
- 2 hour shared medical appointment with lab
- One hour skill classes no labs
- Work with primary care doctors to adjust meds down as BP, sugars and pain decrease

Therapeutic Lifestyle Clinic

- Use diet and lifestyle
- Labs
- B12,
- Folate,
- Homocysteine,
- Lipids,
- CRP,
- ESR,
- Vitamin D
Problems Helped

- Pain
- PTSD, mood, mTBI
- Diabetes, obesity
- RA, Lupus,
- Fatigue
- Fibromyalgia

Brent

Was taking –

2 pills for Diabetes Mellitus
1 pill for High blood pressure
1 pill for high cholesterol

After adopting The
Wahls Protocol™
Lost 95 lbs without
being hungry
Takes no medication

Before Wahls Protocol™ program
3 Pills for diabetes 2/ BP
Chronic severe pain due to
fibromyalgia 2

After
Down 200 lbs.
No Pills
Minimal pain

Facebook post
Jane - Primary Progressive MS which causes extreme weakness to paralysis of my left limbs. I thought my cycling days were over.

Following the Wahls diet this past year, I just finished all 407 miles of RAGRAI.
Creating Health Using Diet and Lifestyle

WAHLS PROTOCOL TOC

Introduction
PART ONE: Before You Get Started
PART TWO: Eating For Your Cellular Health
PART THREE: Going Beyond Food
APPENDICES:
• Appendix A: The Wahls Protocol Complete Food Lists
• Appendix B: Nutrient Comparison Tables
• Appendix C: Resources

- www.terrywahls.com
- Download Toxin and Disease Chart to learn what toxins are associated with top diseases in US
- Facebook
  – Terry Wahls MD
- Twitter @TerryWahls