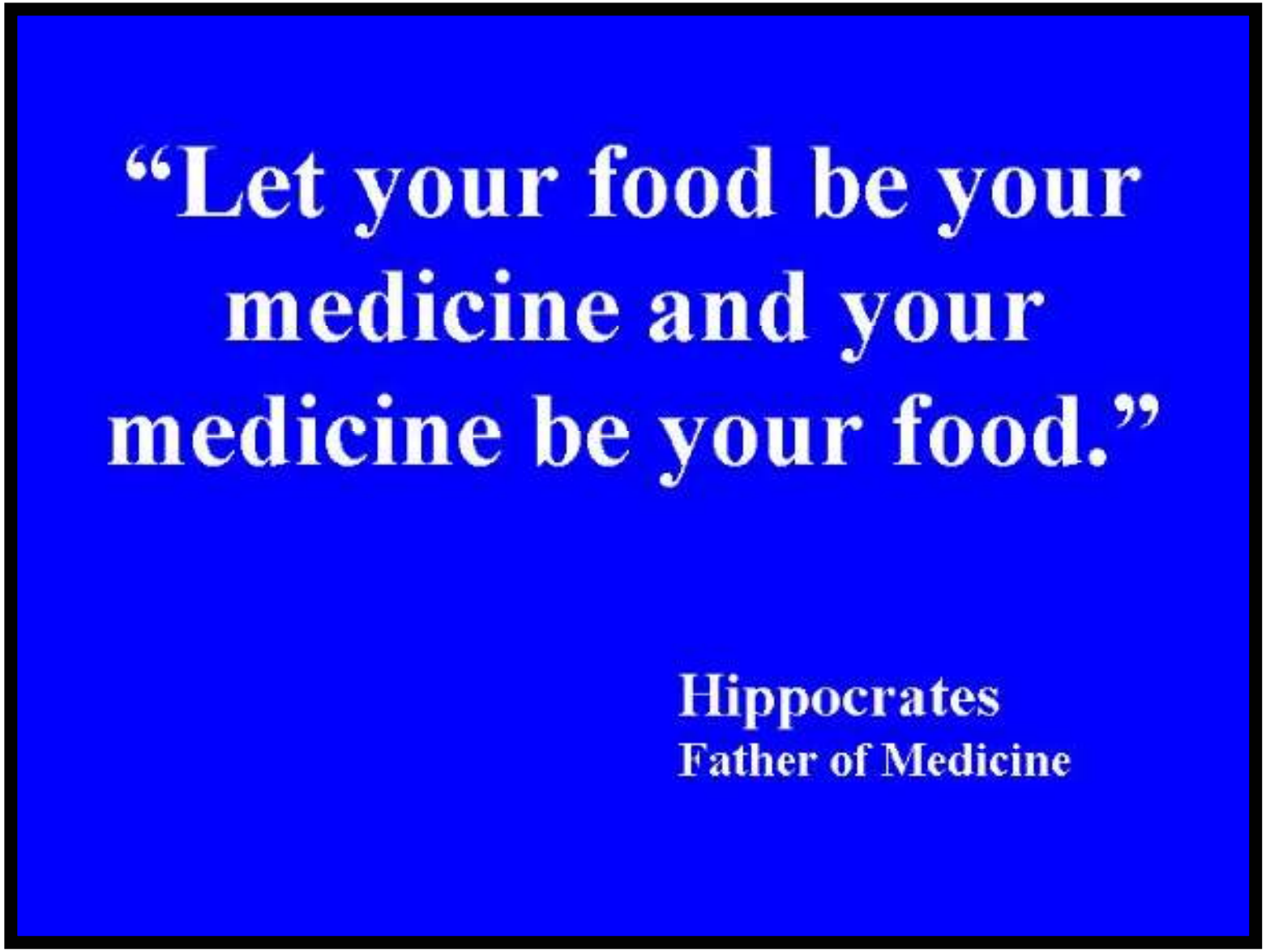

"Let your food be your medicine and your medicine be your food."
Hippocrates
Father of Medicine

“Health comes from the farm, not the pharmacy.”

Alan’s uncle Ruben
circa 1980

The Promise of Nutritional Medicine

- Safety
- Effective for some conditions that respond poorly to conventional medicine
- Fewer drugs and less surgery
- Potential for substantial cost savings
- Advantages of self-care (empowerment, enhanced motivation)

Basic Rules of Nutrition

Eat slowly, chew well.

Don't Wolf Down Your Food

“Nature will castigate those who don’t masticate.”

Upton Sinclair or

Horace Fletcher

Chewing improves digestion

Creates more surface area upon which digestive enzymes can act.

Which ice melts faster on a hot day?

Chewing improves digestion

Stimulates secretion of
salivary amylase
(a digestive enzyme).

Chewing stimulates secretion of saliva . . .

. . . and its protective factors.

Protective factors in saliva

Prevention of heartburn, GERD:

- epithelial growth factor
- mucin
- prostaglandin E_2
- transforming growth factor alpha
- buffering agents (e.g., bicarbonate)

Basic Rules of Nutrition

Eat breakfast.

Eat Breakfast

- Reduces total daily energy intake
- Significantly decreases serum total- and LDL-cholesterol levels
- Lower risk of gallstones and dysmenorrhea in young women (observational studies)
- Improves insulin sensitivity

Basic Rules of Nutrition

Don’t skip meals.

Don't Skip Meals

An irregular meal pattern
produced insulin resistance and higher
total- and LDL-cholesterol levels,
compared with eating regularly.

Eur J Clin Nutr 2004;58:1071-7.

Lifestyle changes that lower future disease risk . . .

. . . can also make you feel better today.

Basic Rules of Nutrition

Cooking method matters.

His Goose is Cooked

Compounds formed during harsh cooking and processing

- Cholesterol oxides, lipid peroxides
- Heterocyclic amines
- Advanced glycation end products

Advanced glycation end products (AGEs)

Formed during cooking and processing, by the interaction of:

- a reducing sugar (i.e., glucose, fructose, or lactose) and protein
- a reducing sugar and amine-containing lipids

Some effects of AGEs

- Absorbed intact, persist in tissues
- Increase the immunogenicity of proteins
- Promote the development of atherosclerosis and complications of diabetes
- Promote cross-linking of protein and accelerate the aging process
- Increase the inflammatory response

Crock of AGEs

Factors that influence the formation of AGEs

Emphasizing boiling, poaching, and stewing over frying, broiling, and roasting may decrease daily AGE intake by up to 50%.

Basic Rules of Nutrition

Stay away from junk food.

Weapons of Mass Destruction

Effects of Sucrose

1. Reduces HDL cholesterol levels.
2. Increases serum triglycerides, uric acid, cortisol, and blood pressure.
3. Increases platelet aggregation and fasting serum insulin in about one-third of the population.
4. Reduces neutrophil phagocytosis by 50%.
5. Empty calories: dilutes nutrient levels in the diet.

The "hypoglycemia" syndrome

Symptoms of "adrenaline surge:"

- sweating
- weakness
- hunger
- irritability
- tachycardia
- nervousness
- anxiety

The "hypoglycemia" syndrome

Other symptoms:

fatigue	ataxia
depression	dysperceptions
insomnia	destructive outbursts
headache	convulsions
vertigo	nausea
numbness	muscle cramps

The "hypoglycemia" syndrome

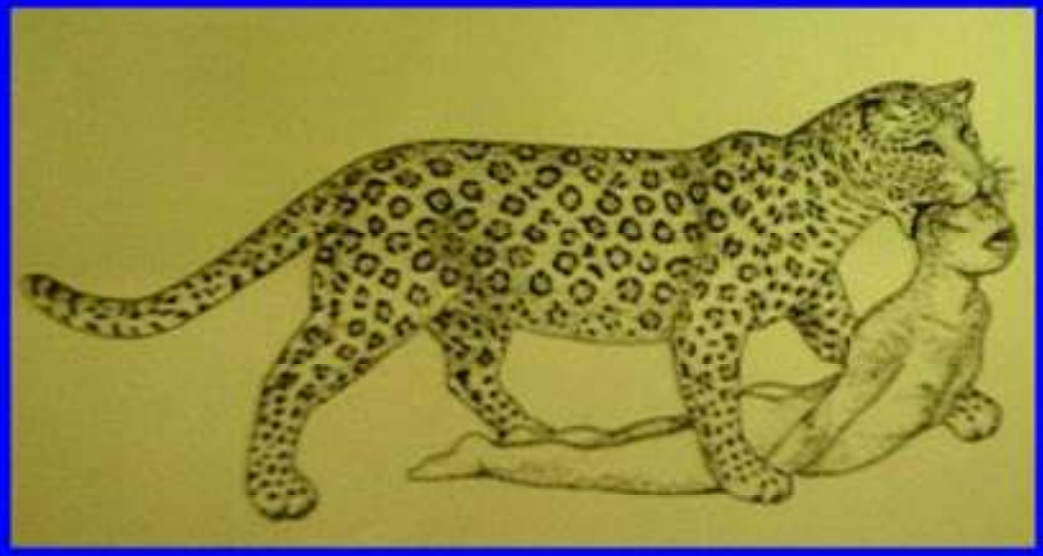
Symptoms of neuroglycopenia:

- blurred vision
- double vision
- confusion
- memory loss
- fainting
- blackouts
- paresis

Basic Rules of Nutrition

Each person is different.

One man's meat . . .



. . . is another man's poison.

Food allergies are common

Symptoms of food allergy

General:

fatigue
depression
food cravings
anxiety
insomnia
obesity

Symptoms of food allergy

Ears, nose, and throat:

chronic nasal congestion
post-nasal drip
recurrent otitis media
Meniere's syndrome

Symptoms of food allergy

Gastrointestinal:

constipation
diarrhea
abdominal pain
IBS

ulcerative colitis
Crohn's disease
gallbladder disease

Symptoms of food allergy

Cardiovascular:

hypertension
cardiac arrhythmia
angina

Symptoms of food allergy

Dermatological:

acne
eczema
psoriasis
canker sores
hives

Symptoms of food allergy

Miscellaneous:

asthma
migraine
bedwetting
frequent urination
teeth grinding
colic
"growing pains"
nephrotic syndrome

A Healthful Diet

- Fruits
- Vegetables
- Whole grains
- Nuts & seeds
- Legumes
- Fish
- Poultry, lean meat
- Dairy products?

Basic Rules of Nutrition

Eat whole foods.

Why whole foods?

More vitamins and minerals

Losses of Vitamins in Refining of Flour

Thiamine	77%
Riboflavin	80%
Niacin	81%
Vitamin B_6	72%
Pantothenate	50%
Folic acid	67%
Vitamin E	86%
Betaine	23%
Choline	30%

Losses of Minerals in Refining of Flour

Magnesium	85%
Calcium	60%
Potassium	77%
Chromium	40%
Manganese	86%
Iron	76%
Copper	68%
Zinc	78%
Selenium	16%

Why whole foods?

More fiber

Effects of Dietary Fiber

- Influences physical character of stool
- Modifies intestinal bacterial milieu
- Binds toxins, bile salts
- Affects absorption of carbohydrates and micronutrients

Clinical Benefits of Dietary Fiber

- Prevention and treatment of constipation
- Reduction of serum cholesterol (soluble fibers)
- Treatment of diverticular disease
- Possible prevention of hemorrhoids, varicose veins, diverticular disease, hiatal hernia, and other "diseases of civilization"

Why whole foods?

Accessory food factors

Accessory Food Factors

Flavonoids
Polyphenols
Indoles
Oligosaccharides
Saponins
Hippuric acid
Peptides

Carotenoids
Glucosinolates
Isoflavones
Sterols
Quinones
Biochanin A
Phosphatides

Beans (legumes)

- Improve blood-sugar regulation
- Lower serum cholesterol
- Form "complete protein" when combined with grain in 1:3 ratio (dry weight)

Vegetables

- Vitamins, minerals, EFAs, carotenoids
- Fiber
- Associated with reduced risk of heart disease, cancer, and many other diseases

Fruit
(High in Pigments)

- High in potassium, flavonoids, vitamin C, and other nutrients
- Contains fiber
- Associated with reduced risk of heart disease, cancer, stroke, osteoporosis

"Pigments" in M&M's

- Yellow 5 Lake
- Red 40 Lake
- Blue 1 Lake
- Yellow 6 Lake
- Blue 2 Lake
- Blue #1
- Blue #2
- Red #40
- Yellow #5
- Yellow #6

"Pigments" in Synthroid

- Red #30
- Red #27
- Yellow #10
- Blue #1
- Blue #2
- Red #40
- Yellow #6

Nuts

Eat 'em raw

- Contain protein, EFAs, fiber, magnesium, arginine
- Lower serum cholesterol, may lower blood pressure
- Associated with reduced risk of cardiovascular disease, diabetes
- Do not appear to cause obesity

Eggs

- High-quality protein; choline, lutein, other nutrients
- Minimal effect on serum cholesterol in most individuals
- No increase in risk of heart disease, except in diabetics
- Scrambling may produce oxidized cholesterol

Basic Rules of Nutrition

Avoid toxins.

Potentially Toxic or Allergenic Additives

- Coal tar dyes
- Preservatives (sodium benzoate, sulfites, BHT, BHA)
- Aspartame
- Monosodium glutamate

Aspartame

Symptoms associated with ingestion include:

- Headaches
- Eye pain
- Loss of vision
- Chest pain
- Palpitations
- Joint pain
- Convulsions
- Depression
- Anxiety
- Diarrhea
- Urinary frequency
- Edema

Monosodium Glutamate

Symptoms associated with ingestion include:

- Fibromyalgia
- Asthma
- Perennial rhinitis
- Depression
- "Chinese restaurant syndrome" (tingling, flushing, chest pressure, palpitations, etc.)

Toxic Contaminants

- Heavy metals
- Agricultural chemicals (pesticides, herbicides, ripening regulators, hormones, antibiotics
- Endocrine disrupters (plastics, some pesticides)

Heavy metals

- Lead: water pipes; contamination from industry enters the food chain
- Aluminum: cans, foil, cookware, municipal water supplies
- Mercury, tin, cadmium

Agricultural Chemicals: Possible Effects

- Pesticides/herbicides
  - Cancer
  - Diabetes
  - Infertility
  - Parkinson's disease
- Hormones
  - Cancer
- Antibiotics
  - Resistant organisms

Plastics: The Sixth Food Group

Some Endocrine Disrupting Chemicals that Leach from Plastic Bottles

- Phthalate esters
- p-Nonyl-phenol
- Bisphenol A

Effects of Endocrine Disrupters

Cancer? Diabetes? Sperm abnormalities?
Miscarriage? Autoimmune disease?
Premature breast development?

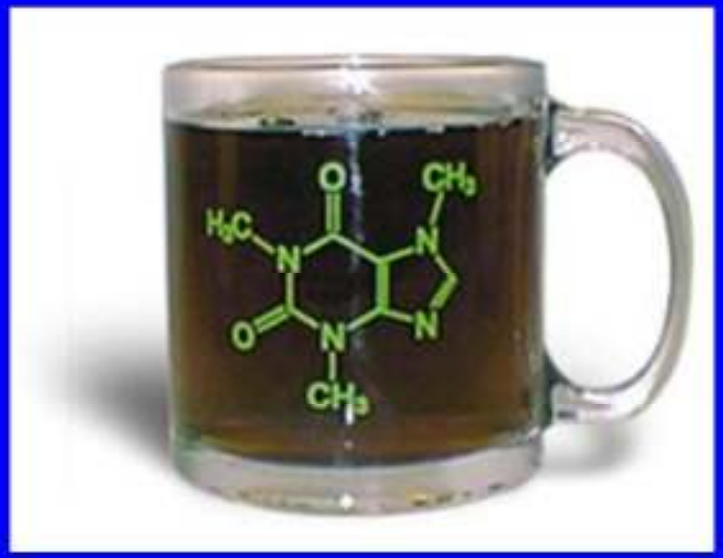
Endocrine Disrupters and Premature Breast Development

Breast development by age 2 yr occurs in 8 of every 1,000 Puerto Rican girls.

Phthalates found in the serum of 68% of girls with premature breast development and in 3% of age-matched controls.

Environ Health Perspect 2000;108:895-900

What about caffeine?



Caffeine: possible adverse effects

1. Hypertension
2. Blood sugar dysregulation
3. Headaches
4. Cardiac arrhythmias
5. Delayed conception

Caffeine: possible adverse effects

6. Anxiety, insomnia
7. Fibrocystic breast disease
8. Gastrointestinal symptoms
9. Osteoporosis
10. Urinary stress incontinence

What about alcohol?

Alcohol

- Chronic abuse can cause multi-system disease (cardiac, neurological, psychiatric, hepatic).
- At moderate doses, alcohol increases blood pressure in susceptible individuals.
- Moderate intake is associated with reduced risk of cardiovascular disease, but a cause-effect relationship has not been proven.

What about Water?

Tap Water

- Pipes: potential source of copper, lead
- Additives
  - Chlorine
  - Aluminum
  - Fluoride

What about supplements?

Rationale for Nutrient Therapy

1. Compensation for a deficient diet
2. Increased requirements resulting from
    a) disease
    b) medications
    c) stress and environmental factors
    d) biochemical individuality
3. Pharmacological effects

Drug-induced nutritional deficiencies

- Thiazide/loop duiretics (Mg^{+2}, K^{+}, thiamine, zinc)
- Alcohol (multiple deficiencies)
- Caffeine (magnesium, calcium)
- Antacids/acid blockers (may reduce absorption of vitamin B_{12}, calcium, iron, folic acid, and other nutrients)
- Anticonvulsants (may cause deficiencies of folic acid, vitamin D, biotin)
- Statins (may deplete coenzyme Q_{10})
- Oral contraceptives (may deplete folic acid, vitamin B_6, other nutrients)

Stress depletes magnesium

- Various stressors (noise, sleep deprivation, type A personality) result in magnesium depletion.

- Magnesium deficiency aggravates the negative effects of stress (e.g., hypertension, gastric ulceration, myocardial damage, noise-induced hearing loss).

Artery 1981;9:205-11; J Am Coll Nutr 1985;4:165-72; Am J Otolaryngol 1994;15:26-32; Clin Cardiol 1997;20:265-8; Magnesium 1986;5:201-10; Magnesium Deficiency. First Eur Congr Magnesium, Lisbon 1983, (Karger, Basel 1985):24-9.

Nutrition and Air Pollution

Vitamins C and E attenuated the adverse effect of ozone on lung function of asthmatics.

Arch Environ Health 2001;56:242-9
Am J Respir Crit Care Med 2002;166:703-9

Vitamin B_{12} and fatigue

Of 16 patients with chronic fatigue syndrome, 10 had undetectable levels of vitamin B_{12} in CSF; all had low-normal levels in blood.

CFIDS Chronicle 1997(Winter):57

Double-blind trial of vitamin B_{12} in fatigued patients without B_{12} deficiency: improvements in general well-being ($p = 0.006$), happiness ($p = 0.032$), fatigue ($p = 0.09$).

Br J Nutr 1973,30:277-83

Symptoms of Mg deficiency

- Fatigue
- Anxiety
- Weakness
- Chest pain
- Dyspnea
- Muscle cramps
- Palpitations
- Memory loss
- Intestinal complaints
- Headaches
- Lightheadedness
- Poor stress tolerance
- Insomnia
- Lump in throat

. . . and help build a healthier world for our children