Food as Medicine: A Practical, Effective and Empowering Approach to Caring for Patients

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Consider food thy medicine and medicine thy food

Hippocrates
Food defines who we are from the molecular to the spiritual level. We rely on adequate intake of macro and micronutrients to grow, build, repair and fill our bodies.

Through food we express our culture, caring, togetherness, family life, religion/faith, philosophy and personal style.

Healthy eating is a blend of all of these elements.
THE STANDARD (NORTH) AMERICAN DIET (SAD DIET)

- Unhealthy fats
- Unhealthy carbohydrates
- Irregular eating
- Increasing portion size combined with
- Physical inactivity
Nutrition and Quality of Life

Eating for health and eating for pleasure are not mutually exclusive
I LOST THIRTY POUNDS ON THE REDUCED-JOY DIET.
What do we tell our patients?

- “Consumers today are deluged with constantly shifting health messages....instead of educating health care consumers, these shifting scientific studies often serve to confuse.”

-USA Today, June 1998
Recent Food Technologies

- Hydrogenated fats
- Chemical farming methods
- Processed grains
- Food additives (color, preservatives)
- Solvent and high temperature extraction processes
For more information...

- **Documentaries:**
  - Food, Inc
  - King Corn
  - The Future of Food

- **Books:**
  - In Defense of Food- Michael Pollan
  - The Omnivore’s Dilemma- Pollan
  - Animal, Vegetable, Miracle-Kingsolver
Criteria for Choosing Diet

1. Maintain healthy weight
2. Enjoyable and thus, sustainable
3. Vitamins, Minerals, Phytochemicals, and EFAs for optimizing cell function and preventing disease
4. Favorable effect on lipids
5. Anti-Inflammatory
6. Affordable
Food and Cancer

During the past two decades, data on diet and cancer have greatly increased.

supports the concept that a substantial proportion of cancer is potentially avoidable by nutritional means.

Quantitative estimates of the preventable proportion in Western countries remain approximately 30 to 40%

Plant based diet lowers BP

Recent meta analysis of 32 studies and 7 clinical trials showed that a vegetarian diet lowered BP by average of 7/5 mm Hg compared to omnivorous diet

1. Protein
2. Carbohydrate
3. Fat
PROTEIN
HEALTHFUL PROTEIN SOURCES

- Whole soy
- Other legumes (pulses like lentils, beans)
- Nuts
- Fish

(issues around sustainable harvesting and environmental toxins, particularly mercury)
ANIMAL PROTEIN

- Issue of modern farming methods (hormones, antibiotics, confined spaces, grain fed)
- Meat and Dairy major source of saturated fat
- Higher consumption of animal protein associated with vascular disease and several types of cancer
- Range-fed organic meats and dairy better choices if desired
But Dr. what about Paleo?....

- Dr. Boyd Eaton, the founding father of our modern understanding of the Paleolithic diet, recently advocated that the protein consumption in this diet be predominantly plant based.

- Everyone eating organic, grass fed meat is not sustainable for our planet!
How much protein should we consume?

- There is little hard science to guide us.
- Deficiency is not a concern for most in our culture (even vegetarian diets).
- 10 – 20% of calories or 8 grams of protein per 20 pounds of body weight generally recommended.
- In Nurses’ Health Study, higher protein diets increased wrist fractures in women.
Red meat consumption and mortality

- Nine articles with seventeen prospective cohorts were eligible in this meta-analysis, including a total of 150,328 deaths

- Higher consumption of total red meat and processed meat is associated with an increased risk of total, cardiovascular and cancer mortality.

Red meat and colon cancer

- The best evidence comes from 2 large 2005 studies, one from Europe, the other from the United States.

- 478,000 cancer free men and women.

- Those who ate the most red meat (about 5 ounces a day or more) were about a third more likely to develop colon cancer than those who ate the least red meat (less than an ounce a day on average).
Red meat

• meta-analysis of 29 studies of meat consumption and colon cancer concluded that a high consumption of red meat increases risk by 28%

• high consumption of processed meat increases risk by 20%

Protein and Type 2 DM

- 4 million person-years of follow-up among 205,802 participants- 3 large cohort studies

- total protein intake positively associated with risk of T2D, largely due to intake of animal protein

- Total vegetable protein intake moderately inversely associated with risk of T2D.
Protein and Type 2 DM

- Substitution of 5% of energy intake from vegetable protein for an equal exchange of animal protein and carbohydrate from refined grains, potatoes, and added sugar was associated with decreased risk of T2D.

- Benefit of replacing animal protein and low-quality carbohydrates with vegetable protein in regard to T2D risk.

- Malik, et al. Dietary Protein Intake and Risk of Type 2 Diabetes in US Men and Women, Am J Epidemiol April 15, 2016 vol. 183 no. 8 715-728
Take Home message on Protein

- Eat more protein from fish and vegetable sources; eat less red meat and dairy, more research showing eliminating might be best

- Good plant based sources of protein include beans, soy, legumes, nuts, nut butters, whole grains
CARBOHYDRATES
CARBOHYDRATES

- Provide most of the calories in most diets
- The body’s preferred fuel source
- Exert the greatest effect on glucose control
- Are central to issues in weight control
- Are often demonized in low carbohydrate diets (ie Atkins Diet)
GLYCEMIC INDEX

- most useful and increasingly validated way to categorize carbohydrates

- Glycemic Index (David Jenkins, University of Toronto, 1981)
FIG. 11  Response to Eating Carbohydrates
Half of the carbohydrates in the North American diet come from: bread, soft drinks, cakes, cookies, donuts, quick breads, sugars, syrups, jams, white potatoes, breakfast cereals and milk.

Willett, W. Eat Drink and be Healthy, 2002, p. 87
<table>
<thead>
<tr>
<th>High Glycemic Index Carbohydrates</th>
<th>Low Glycemic Index Carbohydrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maltose (beer)</td>
<td>Whole wheat or bran bread</td>
</tr>
<tr>
<td>Glucose</td>
<td>Brown rice</td>
</tr>
<tr>
<td>Baked potatoes</td>
<td>Basmati rice</td>
</tr>
<tr>
<td>French fries</td>
<td>Canned peas</td>
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<tr>
<td>Rice flour</td>
<td>Sweet potatoes</td>
</tr>
<tr>
<td>Modified starch</td>
<td>Whole wheat pasta</td>
</tr>
<tr>
<td>Mashed potatoes</td>
<td>Spaghetti (al dente)</td>
</tr>
<tr>
<td>Potato chips</td>
<td>Fresh peas</td>
</tr>
<tr>
<td>Honey</td>
<td>Whole wheat, sugar-free</td>
</tr>
<tr>
<td>Hamburger rolls</td>
<td>cereal</td>
</tr>
<tr>
<td>Cooked carrots</td>
<td>Oatmeal</td>
</tr>
<tr>
<td>Corn flakes, popcorn</td>
<td>Whole grain pasta</td>
</tr>
<tr>
<td>Instant rice</td>
<td>Kidney beans</td>
</tr>
<tr>
<td>Rice cakes</td>
<td>Fresh unsweetened fruit juice</td>
</tr>
<tr>
<td>Puffed rice</td>
<td>Pumpernickel bread</td>
</tr>
<tr>
<td>Cooked broad beans</td>
<td>Rye bread</td>
</tr>
<tr>
<td>Pumpkin</td>
<td>100% integral bread</td>
</tr>
<tr>
<td>Watermelon</td>
<td>Figs, dried apricots</td>
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<tr>
<td>Sugar (saccharose)</td>
<td>Genuine Indian corn</td>
</tr>
<tr>
<td>White bread</td>
<td>Wild rice</td>
</tr>
<tr>
<td>(baguette)</td>
<td>Quinoa</td>
</tr>
<tr>
<td>Refined sweetened</td>
<td>Raw carrots</td>
</tr>
<tr>
<td>cereals</td>
<td>Dairy products</td>
</tr>
<tr>
<td>Chocolate bars</td>
<td>Dried beans</td>
</tr>
<tr>
<td>Boiled peeled potatoes</td>
<td>Brown or yellow lentils</td>
</tr>
<tr>
<td>Cola, soda</td>
<td>Chickpeas</td>
</tr>
<tr>
<td>Cookies</td>
<td>Fresh fruit</td>
</tr>
<tr>
<td>Corn</td>
<td>Green beans</td>
</tr>
<tr>
<td>White rice</td>
<td>Soy vermicelli</td>
</tr>
<tr>
<td>Noodles, ravioli</td>
<td>Sugar-free marmalade</td>
</tr>
<tr>
<td>Raisins</td>
<td>Green lentils</td>
</tr>
<tr>
<td>Boiled unpeeled</td>
<td>Split peas</td>
</tr>
<tr>
<td>potatoes</td>
<td>Dark chocolate (&gt;70% cacao)</td>
</tr>
<tr>
<td>Beets</td>
<td>Fructose</td>
</tr>
<tr>
<td>Sweetened preserves</td>
<td>Soy, peanuts</td>
</tr>
<tr>
<td>Refined semolina</td>
<td>Fresh apricots</td>
</tr>
<tr>
<td>Long-grain rice</td>
<td>Green vegetables, tomatoes,</td>
</tr>
<tr>
<td>Bananas, cantaloupe</td>
<td>eggplant, zucchini, garlic,</td>
</tr>
<tr>
<td>Well-cooked white</td>
<td>onions, etc.</td>
</tr>
<tr>
<td>spaghetti</td>
<td>&lt;15</td>
</tr>
</tbody>
</table>
Influences on the GI of foods

- Amount of processing (increases surface area)
- Fiber content (decreases GI)
- Fat content (many “fat-free” diet foods are high GI and contribute to obesity) and protein slow stomach emptying and lower GI
Influences on the GI of foods

- Lemon and vinegar lower GI

- Type of starch contained: amylose (i.e. basmati rice) vs amylopectin (i.e. sticky rice)

- Amylose lower GI than amylopectin

- Al dente pasta lower GI than well-done
Low GI diets are linked to

- Better weight control
- Diabetes prevention, improved glycemic control
- More favorable lipid profiles
- Lower heart attack rates (Nurses Health Study)
- Earlier satiety
GI feeding study

- Two groups fed iso-caloric meals (breakfast and lunch)
- Meals differed only in GI
- Subjects free to graze for five hours after meals
- 81% greater intake of calories in high GI group
YOUR HEALTH AND THE GLYCEMIC INDEX

High-glycemic chart

- RELEASE ENERGY QUICKLY
- FEEL HUNGRY SOONER
- EAT MORE

Low-glycemic chart

- RELEASE ENERGY SLOWLY
- FEEL FULL LONGER
- EAT LESS

YOU CAN RESET YOUR EATING HABITS...
FATS
FATS

- Fats are not BAD!!!

- As low fat products proliferated in the 80’s and 90’s, so did obesity rates.

- Mediterranean Diet - high in the “right” fats.

- Ancel Keys’ famous “7-Countries Study” (1950’s) demonstrated that total fat in the diet and heart disease are not correlated.

- Crete, with the highest fat intake (40% of calories) had the lowest CAD rate.
Fats to avoid/reduce

- Hydrogenated/trans fats (increase LDL and lower HDL - worse than saturated, and highly correlated with CAD)

- Deep fried foods (commercial deep frying fats, oxidized and trans fats)

- Saturated fats (key sources are meat and dairy) - increase LDL and HDL

- Associated with insulin resistance
“Hydrogenated oils represent a huge disaster. They are one of the worst things ever to happen in our food supply”
- Walter Willett, MD

–Chair of Department of Nutrition at Harvard School of Public Health
Wow. Banning trans fats has had quite an impact.
FATS TO EMPHASIZE

- Monounsaturates (olive oil, avocado, nuts) decrease LDL and BP, anti-oxidant flavonoids in olive oil

- Essential fatty acids (especially omega-three)

- Omega six fatty acids are “essential” but are consumed in excess in the North American diet (meat, poultry, vegetable oils)
OMEGA 3 FATS

- critical to cell membrane function
- modulation of inflammation
- healthy brain function
- arrhythmia protection

- Prospective trials show supplementation decreases NSAID use in RA

- Healthiest diets are rich in omega three fats
OMEGA THREE FATS

- PLANT SOURCES generally provide alpha-linolenic acid (ALA) and include walnuts, flax seeds, pumpkin seeds, hemp seeds, purslane

- ALA converted to DHA and EPA in body
OMEGA THREE FATS

- ANIMAL SOURCES provide EPA and DHA and include salmon, herring, mackerel, sardines, and many other fish

- Avoid farmed salmon and large fish that concentrate toxins
Omega-6

LA

Linoleic acid (n-6, 18:2, Δ⁹,12)

AA

Arachidonic acid (n-6, 20:4, Δ⁵,8,11,14)

Omega-3

ALA

α-Linolenic acid (n-3, 18:3, Δ⁹,12,15)

EPA

Eicosapentaenoic acid (n-3, 20:5, Δ⁸,11,14,17)
Among the fatty acids, the omega-3 polyunsaturated fatty acids (PUFA) possess the most potent immunomodulatory activities.

PUFAs from fish oil - eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) -- are more biologically potent than alpha-linolenic acid (ALA).
Omega 3

• clinical trials assessing the benefits of dietary supplementation with fish

• rheumatoid arthritis, Crohn's disease, ulcerative colitis, psoriasis, lupus erythematosus, multiple sclerosis and migraine headaches.

• reveal significant benefit, including decreased disease activity and a lowered use of anti-inflammatory drugs.

_J Am Coll Nutr._ 2002 Dec;21(6):495-505. **Omega-3 fatty acids in inflammation and autoimmune diseases.** Simopoulos AP.
Foods that contain good fats “Omega-3”
Foods that contain bad fat
“Omega-6 and 9”
- Margarine
- Chips
- Cookies
- Cakes
- Biscuits
- Salad dressings
- Chocolate bars
- Crackers
Refined sugar – READ LABELS

- Sucrose (table sugar)
- Glucose
- Maltose
- Lactose
- Fructose
- Corn syrup (high fructose corn syrup)
- White grape juice concentrate
OKINAWA DIET

- Okinawa has one of the highest per capita centenarian rates in the world
- Very high in a diverse assortment of fruits and vegetables
- High in fish and soy and whole grain, low in meats, sweets, dairy and processed foods (low omega 6/omega 3 ratio)
OKINAWA DIET

- Food flavored with herbs (vs. lots of salt, fat, additives)
- Fluids are green tea and water
- Modest portion sizes
- Eating traditions embedded in a rich health promoting culture
PUTTING IT ALL TOGETHER

THE MEDITERRANEAN DIET
MEDITERRANEAN DIET

- High in fruits, vegetables, whole grains, legumes, nuts, seeds
- High in fish, low in meat and dairy
- Olive oil is principal fat
MEDITERRANEAN DIET

Red wine with dinner

Moderate use of yogurt and cheese

Delicious, health-promoting diet that dramatically reduces heart disease, cancer incidence, and systemic inflammatory markers

Mediterranean Diet and Effect on Endothelial function and Inflammation

- 12 weeks of MD = significantly more pronounced increase in flow mediated dilatation
- significant decrease in high-sensitive C reactive protein, interleukin-6, intracellular adhesion molecule-1

Fruits and Vegetables are:

- Nutrient dense
- Rich in fiber
- Rich in protective phytochemicals (usually the colored pigment)
- Rich in vitamins and minerals
- Protective against heart disease, cancer, obesity, hypertension, stroke, eye diseases, diverticular disease
Fruits and Vegetables are:

- Low in calories
- Rich in visually appealing color
- Rich in flavor
- Low in the food chain (leading to less accumulation of biotoxins)
- Chemically complex with hundreds of identified and many as yet unidentified health-promoting plant chemicals
Eat a RAINBOW of fruits and vegetables

Orange – Beta Carotene
Green – Glucosinolates
Yellow/Green – Lutein
Red – Lycopene
Purple – Anthocyanins
White/Green – Allyl Sulfides
fresh fruit consumption

- a higher level of fruit consumption was associated with lower blood pressure and blood glucose levels
- largely independent of other dietary and non-dietary factors
- significantly lower risks of major cardiovascular diseases

DAIRY CONTROVERSY

- High in saturated fat, calories
- Lactose intolerance common
- Milk protein exacerbates inflammatory conditions in many people
Dairy

- Less controversial calcium sources available – fortified soy milk, fortified OJ, dark green leafy vegetables, broccoli

- Calcium balance likely related to a host of other dietary factors

- Population studies correlate higher per capita calcium intake with higher fracture rates
DAIRY CONTROVERSY

- Nurses Health Study and Health Professionals Follow-up Study showed **no protection of dairy against fractures**

- compared groups consuming 2 or more glasses milk per day with less than 1 glass per week

- higher prostate cancer incidence in men
• Societies with greatest longevity consume less dairy

• Dairy contributes to the pleasure of food for many people, but evidence is equivocal as to whether it should be promoted for health

• Low-fat dairy part of DASH diet
ANTI-INFLAMMATORY DIET

- Collateral benefit - this eating plan is also generally best for overall health and disease prevention
ANTI-INFLAMMATORY DIET

- Emphasize fruits, vegetables, Omega 3 fats, low GI carbs, nuts, seeds

- Limit meat and dairy, processed foods, additives

- Identify sensitivities: dairy, wheat etc.

- Reduce ratio of omega 6 (pro-inflammatory) to omega 3 (inflammation modulating)
HEALTHY SWEETS (such as plain dark chocolate) Sparingly

RED WINE (optional)
No more than 1-2 glasses a day

SUPPLEMENTS
Daily

TEA (white, green, oolong)
2-4 cups a day

HEALTHY HERBS & SPICES (such as garlic, ginger, turmeric, cinnamon) Unlimited amounts

OTHER SOURCES OF PROTEIN (high quality natural cheeses and yogurt, omega-3 enriched eggs, skinless poultry, lean meats)
1-2 a week

COOKED ASIAN MUSHROOMS
Unlimited amounts

WHOLE SOY FOODS (edamame, soy nuts, soymilk, tofu, tempeh)
1-2 a day

FISH & SEAFOOD (wild Alaskan salmon, Alaskan black cod, sardinos)
2-6 a week

HEALTHY FATS (extra virgin olive oil, expeller-pressed canola oil, nuts - especially walnuts, avocados, seeds - including hemp seeds and freshly ground flaxseeds)
5-7 a day

WHOLE & CRACKED GRAINS
3-5 a day

PASTA (al dente)
2-3 a day

BEANS & LEGUMES
1-2 a day

VEGETABLES (both raw and cooked, from all parts of the color spectrum, organic when possible)
4-5 a day minimum

FRUITS (fresh in season or frozen, organic when possible)
3-4 a day
If you remember only one slide ...

- Eat Food
- Not too much
- Mostly plants

Michael Pollan - In Defense of Food