“Tell me what you eat, and I will tell you what you are.”

Anthelme Brillat-Savarin
Judge, Epicure
1755 - 1826

The Problem

8.3% Diabetes

American Diabetes Association
The Problem

1 in 3 adults
**Hypertension**

Centers for Disease Control and Prevention

The Problem

616,000
**Heart Disease Mortality**

Centers for Disease Control and Prevention

The Problem

140,000
**Stroke Deaths**

Centers for Disease Control and Prevention

Economic Impact – The Average Household Spend

$4290.00
8% of total expenses
### Economic Impact – Heart Disease

**$818 Billion**

Between 2010 - 30, the cost of medical care for heart disease (in 2008 dollar values) will rise from $273 billion to $818 billion.


### Economic Impact – Diabetes

**$240+ billion**

Diabetes Related Illness

### The Problem

Mr. H is a 48 year old African-American.

There is a five year history of hypertension, diabetes and hyperlipidemia. He also has chronic active hepatitis C and is part of a randomized trial that included pegylated, peginterferon alfa-2b (Pegasys) and other anti-virals.

During the trial he was on metoprolol tartrate, lisinopril, hydrochlorothiazide, glipizide and pravastatin. He is faithful about taking his medications and says that he really doesn’t like the idea of all this medication.

He works as a contractor, is married and does not smoke. He does not exercise but his job is "physical." He eats "on the run." He explains that he will usually stop at McDonald’s for an Egg McMuffin and coffee for breakfast. Sometimes he will eat in the cafeteria for lunch but most of the time he has a Subway turkey sub.

He will snack in between lunch and when he goes home for dinner usually on something from the vending machine like peanut butter crackers. For dinner his wife does all the cooking and they rarely eat out. She will use boxed meals like Hamburger Helper about half the time and make meals from scratch the other half.

He will come with his to the visit.

### Case Study - 2007

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He will come with him to the visit.

### 35.7% Obesity

Centers for Disease Control and Prevention

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3/5/18
Case Study - 2007

Initial BP = 142/88
Height 72 inches   Weight 229 lbs.
BMI = 31.2
Waist = 44 inches  Hips=43 inches
Waist to hip ratio = 1.023

Initial examination is otherwise normal.

Initial labs:
Creatinine = 1.0
Hemoglobin A1c = 6.3%
Total Cholesterol=184
Triglycerides = 92
HDL = 44
LDL = 79

Weight Loss - State of the Art

Comparison of Weight-Loss Diets with Different Compositions of Fat, Protein, and Carbohydrates

811 overweight adults to one of four diets the targeted percentages of energy derived from:

<table>
<thead>
<tr>
<th>Fat</th>
<th>Protein</th>
<th>Carbohydrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td>15%</td>
<td>65%</td>
</tr>
<tr>
<td>20%</td>
<td>25%</td>
<td>55%</td>
</tr>
<tr>
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<td>45%</td>
</tr>
<tr>
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<td>25%</td>
<td>35%</td>
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At 6 months, participants assigned to each diet had lost an average of 6 kg, 7% of their initial weight.

Effect of Low-Fat vs Low-Carbohydrate Diet on 12-Month Weight Loss in Overweight Adults and the Association With Genotype Pattern or Insulin Secretion

The DIETFITS Randomized Clinical Trial.

February 20, 2018
Ancel Keys, PhD

**Lyon Heart Study**
Prospective study of 605 first heart attack patients
2 groups:
- study given instruction Med Diet
- control told to follow a “prudent” diet.

Study group with a 50 - 70% reduction in second event

**Adherence to a Mediterranean Diet and Survival in a Greek Population - Antonia Trichopoulou**

22,000 study population
Prospective Design
Significant reduction coronary disease AND cancer
9 dietary components

*Mediterranean Diet Score*

*from 0 - 9*

depending on the amounts consumed daily

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**1. Vegetables**

Each additional serving of fresh fruit and vegetables per day reduces your risk of CHD by 4% (J Nutr 2006 136: 2588-2593)

Male: 303 grams = 10.8 ounces
Female: 248 grams = 8.9 ounces

This equates to 2-3 cups of vegetables per day:
- leafy greens
- carrots
- celery
- beets

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**2. Legumes**

Lentils, peas, peanuts, snap beans, bean pods

10K men, Eating legumes 4 times or more per week reduces the risk of heart disease by as much as 22% (Archives 2001 161: 2573 - 2578)

Male: 60 grams = 2.1 ounces
Female: 49 grams = 1.75 ounces

2 to 3 servings per week.

One serving is equivalent to approximately:
- 1/3 of a cup of raw beans
- 1/2 of a cup of cooked beans
- 1/4 of a cup of peanuts

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3. Fruits and Nuts

Male: 249 grams = 8.9 ounces
Female: 216 grams = 7.7 ounces

1 to 2 servings per day.

One serving of fruit is equivalent to:
- An orange or apple the size of a baseball
- 7–2 ½ inch strawberries
- 1 cup of dried fruit
- 12 grapes

One serving of nuts is equivalent to:
- 24 almonds
- 15 pecan halves
- 14 walnut halves
- 18 cashews

4. Cereals & Whole Grains

Male: 291 grams = 10.4 ounces
Female: 248 grams = 8.9 ounces

One serving is equivalent to:
- 1 slice of sandwich bread
- 1/4 of a cup of uncooked grains and cereals (rice, bulgur, millet, oatmeal, quinoa, polenta)
- 1/2 of cooked grains and cereals

5. Fish

Male: 26 grams = 1 ounce
Female: 21 grams = 0.75 ounces

This is greater than or equal to about 2 servings per week.

6. Oils / Fats

1:1.6 grams = 1:1.wt.:wt.

One serving of fats is equivalent to:
- 1 teaspoon of any vegetable oil
- 1 tablespoon of walnuts
- 1 tablespoon of butter
- 1 teaspoon of olive oil
- 1 teaspoon of sunflower seeds
- 1 teaspoon of pumpkins
- 1 teaspoon of butter

Mediterranean Diet

7. Dairy

Men with the largest increase in total dairy intake actually gained slightly more weight over the course of the 12-year study than those who decreased their dairy intake the most. (AJCN 2006;83: 559 - 66)

Male: 201 grams = 7.2 ounces
Female: 194 grams = 6.9 ounces

A serving is equivalent to:
- 1 cup of milk
- ¾ cup of gruyere cheese
- 1 cup yogurt

8. Meats

Male: 109 grams = 3.9 ounces
Female: 91 grams = 3.25 ounces

The median consumption was about 8 ounces of meat per day.

9. Alcohol

Male: 0 - 50 grams = ~ 2 drinks
Female: 0 - 25 grams = ~ 1 drink

One drink is equivalent to:
- 12 ounces of regular beer (about 5% alcohol)
- 5 ounces of wine (about 12% alcohol)
- 1.5 ounces of distilled spirits (about 40% alcohol)

Mediterranean Diet and Diabetes

Effects of a Mediterranean-style diet on the need for antihyperglycemic drug therapy in patients with newly diagnosed type 2 diabetes


4 years, 215 participants - Prospective
New onset diabetics

Endpoint: Medication
Effects of a Mediterranean-Style Diet on the Need for Antihyperglycemic Drug Therapy in Patients With Newly Diagnosed Type 2 Diabetes
(Am Intern Med. 2009;151:306-314)

4 years, 215 participants – Prospective
New onset diabetics
Endpoint: Medication

After 4 years only 44% in the study group needed medication
70% of the standard low-fat diet needed medication

26% difference with diet alone

Mediterranean Diet and Diabetes

Mediterranean Dietary Pattern and Prediction of All-Cause Mortality in a US Population: Results From the NIH-AARP Diet and Health Study
(Ann Intern Med. 2007;167(22):2461-2468)

In 1995 - 380,000 members of the AARP – Prospective
No history of cancer, heart disease, diabetes, chronic disease.
Five years of follow-up
Causes of death in the over 12,000 subjects who had died during
Followed with each subject’s dietary score:
For men: Those with higher levels of the Mediterranean Diet score (7-9) were 23% less likely to die from any cause, including cancer and heart disease, than those whose diets received the lowest scores (0-3).
An increase of just one point in the dietary score meant an additional 5% reduction in risk of death from all causes.
Women saw a 14% lower risk of death from cancer.

Mediterranean Diet and Western Style Diet

Two Points!

It’s really rather simple...

Short, simple messages, repeated over and over.

Case Study – 2013

BP = 142/88
Height 72 inches  Weight 226 lbs.
BMI = 30.65
Medications: Metformin

Labs:
Creatinine = 1.1
Hemoglobin A1c = 5.4%
Total Cholesterol = 131
Triglycerides = 182
HDL = 42
LDL = 57
1. Community Programming

Free Cooking Classes
- 8 module Adult Beginner Series
- 6 module Adult Beginner Series (Spanish)
- 8 module Adult Intermediate Series
- 6 module Kids Series
- 6 module Family class
- 6 module Senior Series
- 3 module Expectant Mother Series
- One week Kids Summer Camp (ages 4 to 8)

Culinary medicine elective (M1 and M2 students)
- 8 class culinary medicine elective

Required sessions for M1 and M2 students
- 3 modules incorporated into FIM
- Introduce students to nutrition, cooking technique and how to communicate with patients
- Simulation-Based Medical Education with Deliberate Practice (SBME-DP)

Culinary medicine rotation (M3 and M4 students)
- 4 week rotation, offered to Tulane and visiting students
- Leadership of community classes.
- Curriculum building
- Help guide the cooking classes for 1st year students and community members

Service Learning Programming
- Johnson and Wales rotation
- Research Rotation (M4 and MD/MPH Candidates)

2. Medical Student Programming

- Culinary medicine elective (M1 and M2 students)
- 8 class culinary medicine elective

Required sessions for M1 and M2 students
- 3 modules incorporated into FIM
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3. Culinary School Collaborations

- Johnson & Wales University College of Culinary Arts
- Northwest Arkansas Community College
- Mississippi Gulf Coast Community College
- New Orleans Center for Creative Arts
- Delgado Community College
- Grand Rapids Community College

4. Professional Programming

Continuing Medical Education
- 25 Modules – 4 -5 hours CME (MD, DO, NP, PA, RD, CDE, Pharmacist, Nursing)
- In conjunction with conferences (OBGYN, ASN, Cardiometabolic Risk Summit)

Certified Culinary Medicine Specialist
- Integrate nutritional counseling to supplement pharmacological treatment
- Educate patients about weight loss and weight management
- Develop practical examination-room dialogues that inspire behavioral change
- 60 Credit Hours – combination of hands-on, online, readings, quizzes
- 100 question certification examination
- 190 enrolled – 20 certified
### 5. Research: CHOP - Medical Students

<table>
<thead>
<tr>
<th>Role of fiber in disease prevention and examples of ingredients.</th>
</tr>
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<td>The role glycemic index and load in dietary management.</td>
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<td>Potential advantages and disadvantages of a vegetarian diet.</td>
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<td>Understanding of DASH diet and its health effects.</td>
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<td>Health impact of a very low fat diet.</td>
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<td>Weight loss in overweight or obese patients.</td>
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<td>Eating disorders.</td>
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<td>Moderate alcohol consumption.</td>
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- Omega-3 and -6 fatty acids in heart health & examples of dietary oils/fats.

- Serving size from MyPlate strategies for a patient's diet.

- Calculation of body mass index (BMI) and waist-to-hip ratio based on gender.

- Basic metabolic roles.

- Antioxidant basic metabolic roles. & age.
### Year 1
- Assessing calories and fat per food label.
- Modest weight loss for diabetes.
- Calories per gram of protein, carbohydrate, and basic metabolic roles.
- Antioxidant-rich produce while shopping.
- Overall benefits of aerobic exercise.
- Role of water and hydration in health, and fluid needs based on activity & age.
- Calculation of body mass index (BMI) and waist-to-hip ratio based on gender.
- Omega-3 and -6 fatty acids in heart health & examples of dietary oils/fats.
- Reported health risks of high protein/high fat diets (e.g., Atkins).
- Serving size from MyPlate.
- Moderate alcohol consumption.
- Eating disorders.
- Role of dietary cholesterol and saturated fat in elevating blood lipids.
- Recommended diabetic dietary patterns.
- Weight loss in overweight or obese patients.
- Health impact of a very low fat diet.
- Understanding of Mediterranean diet principles and its health effects.
- Understanding of DASH diet and its health effects.
- Potential advantages and disadvantages of a vegetarian diet.
- Role of saturated, polyunsaturated and monounsaturated fats in diet.
- The impact of Celiac disease and strategies for a patient’s diet.
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- The role of glycemic index and load in dietary management.
- Role of fiber in disease prevention and examples of ingredients.

### Research: CHOP – Medical Students

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<th>High/Medium vs. Low</th>
<th>O.R.</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olive Oil</td>
<td>1.50</td>
<td>0.074</td>
</tr>
<tr>
<td>Fruit</td>
<td>0.65</td>
<td>0.110</td>
</tr>
<tr>
<td>Vegetables</td>
<td>1.35</td>
<td>0.141</td>
</tr>
<tr>
<td>Vegetables/Fruits</td>
<td>0.49</td>
<td>0.044</td>
</tr>
<tr>
<td>Legumes</td>
<td>2.89</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Seafood</td>
<td>0.78</td>
<td>0.259</td>
</tr>
<tr>
<td>Alcohol</td>
<td>1.17</td>
<td>0.627</td>
</tr>
<tr>
<td>Meat</td>
<td>3.65</td>
<td>0.027</td>
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<tr>
<td>Whole Grains</td>
<td>0.76</td>
<td>0.321</td>
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<tr>
<td>Cooking Takes Excessive Time</td>
<td>0.60</td>
<td>0.010</td>
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<tr>
<td>Eating Healthier Can Prevent Disease</td>
<td>1.46</td>
<td>0.324</td>
</tr>
<tr>
<td>Cooking Class Can Improve Health</td>
<td>1.20</td>
<td>0.648</td>
</tr>
<tr>
<td>Can Find Healthy Foods</td>
<td>1.44</td>
<td>0.297</td>
</tr>
<tr>
<td>More likely to cook &gt; 4 days per week</td>
<td>1.48</td>
<td>0.037</td>
</tr>
<tr>
<td>More likely to use leftovers</td>
<td>1.46</td>
<td>0.100</td>
</tr>
<tr>
<td>Plan Meals</td>
<td>1.43</td>
<td>0.132</td>
</tr>
<tr>
<td>Use Nutrition Labels</td>
<td>1.25</td>
<td>0.253</td>
</tr>
<tr>
<td>Use MyPlate</td>
<td>1.47</td>
<td>0.286</td>
</tr>
<tr>
<td>Exercise</td>
<td>3.09</td>
<td>&lt;0.001</td>
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### Research: CHOP – Community

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<tr>
<td>Olive Oil</td>
<td>1.49</td>
<td>2.86</td>
</tr>
<tr>
<td>Fruit</td>
<td>4.54</td>
<td>8.20</td>
</tr>
<tr>
<td>Vegetables</td>
<td>2.33</td>
<td>3.80</td>
</tr>
<tr>
<td>Vegetables/Fruits</td>
<td>5.48</td>
<td>12.81</td>
</tr>
<tr>
<td>Legumes</td>
<td>1.35</td>
<td>2.05</td>
</tr>
<tr>
<td>Seafood</td>
<td>1.33</td>
<td>2.04</td>
</tr>
<tr>
<td>Alcohol</td>
<td>1.10</td>
<td>2.57</td>
</tr>
<tr>
<td>Red Meat</td>
<td>1.13</td>
<td>2.44</td>
</tr>
<tr>
<td>Whole Grains</td>
<td>1.65</td>
<td>2.38</td>
</tr>
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</table>

### 5. Research: CHOP – Family Series
“Food is our common ground, a universal experience.”

James Beard