Implementation of Intermittent Fasting Prescriptions: Breaking Through the Barriers

‘The Fountain of Youth’ Maestro della Manta, circa 1411.
Wistar Rats

Diets initiated at 10 months

Diets initiated at 18 months

GOODRICK, INGRAM, REYNOLDS, FREEMAN, AND CIDER
ters which are genuine and beyond dispute. The cures which they record are altogether without precedent, I think. The reader will find in the course of the book (page 63) a tabulation of the results of 277 cases of fasting. In this number of desperate cases, there were only about half a dozen definite and unexplained failures reported. Surely it cannot be that medical men and scientists will continue for much longer to close their eyes to facts of such vital significance as this.
County-Level Diabetes Prevalence, 2007

Age-adjusted percent of adults older than age 20 who have diabetes

Hormesis

Anhormesis

Heart Disease Death Rates, 2007-2009
Adults Ages 35+, by County

Maps show heart disease death rates across the United States, with different colors indicating varying rates. The rates are age-adjusted and average annual deaths per 100,000. Rates are spatially smoothed to enhance the stability of rates in counties with small populations.

ICD-10 codes for heart disease: I00-I09, I11, I13, I20-I51

Data Source: National Vital Statistics System and the U.S. Census Bureau

Alaska
Hawaii
Stem Cells

Dentate Gyrus

BDNF

ADAPTIVE RESPONSES
(Improved Cognition, Mood, Neuromuscular and Cardiovascular Health)

Challenges
Fasting
Exercise
Intellectual

CA3

Challenges
Fasting
Exercise
Intellectual

CA2

CA1

Stem Cells

FGF2

Neurogenesis

Dentate Gyrus

BDNF
High School Graduates

Source: U.S. Census Bureau, 2007-2011 ACS 5-year estimates.

Note: Alaska and Hawaii not shown to scale.
Alternate day fasting: eating no food or <600 calories every other day.
5:2 diet: eating normally 5 days each week and eating <500 calories the other 2 days.
Daily time-restricted eating: food is consumed only during a 4-8 hour period each day.

Fasting and Society: Circumventing and Removing the Barriers

Medical Education
- Emphasize prevention
- Courses on energy restriction and exercise

Physicians
- Pediatricians
- General practice
- Psychiatrists
- Disease specialists

Diagnosis and Treatment
- Prescriptions
  - Energy restriction plans
  - Exercise plans

Rehabilitation Facilities
- 3 – 4 week intervention
- Intermittent ER
- Daily Exercise
- Monthly Follow-Up

BARRIERS
- Food Industry
- Pharmaceutical Industry
- Agriculture
- Effort-sparing technologies

Government
- Federal
- State
- Local

Education
- Primary
- Secondary
- College

Families
- Parents lead by example

Media
- Internet
- Television
- Newspapers

Biomedical Research
- NIH
- Foundations
- Others

Effort-sparing technologies

Food Industry

Pharmaceutical Industry

Agriculture

Other barriers include: Effort-sparing technologies
<table>
<thead>
<tr>
<th>Company</th>
<th>Revenue ($ millions)</th>
<th>Profits ($ millions)</th>
<th>Profits % of Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walmart</td>
<td>408,214</td>
<td>14,335</td>
<td>3.51</td>
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<tr>
<td>Exxon</td>
<td>284,650</td>
<td>19,280</td>
<td>6.77</td>
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<tr>
<td>J &amp;J</td>
<td>61,897</td>
<td>12,266</td>
<td>19.8</td>
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<tr>
<td>Pfizer</td>
<td>50,009</td>
<td>8,635</td>
<td>17.6</td>
</tr>
<tr>
<td>Merck</td>
<td>27,328</td>
<td>12,901</td>
<td>47.2</td>
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<tr>
<td>Abbott</td>
<td>30,052</td>
<td>5,745</td>
<td>19.1</td>
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<tr>
<td>Apple</td>
<td>36,537</td>
<td>5,704</td>
<td>15.6</td>
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<tr>
<td>Eli Lilly</td>
<td>21,836</td>
<td>4,328</td>
<td>19.8</td>
</tr>
<tr>
<td>Bristol–Meyer</td>
<td>21,634</td>
<td>10,612</td>
<td>49.05</td>
</tr>
</tbody>
</table>

Source: Fortune 500 (2010)
“Man has an inborn craving for medicine. Heroic dosing for several generations has given his tissues a thirst for drugs....It is really one of the most serious difficulties with which we have to contend. Even in minor ailments, which would yield to dieting or to simple home remedies, the doctor’s visit is not thought to be complete without the prescription. “

William Osler (1932), the father of modern medicine.

In some places, with some psychiatrists, patients are seen for 10 minutes or so and treated like checkbooks: the more patients seen, the more profit made. Add the fact that usually such practice involves giving drugs for symptoms—that medications are the main activity in such assembly-line psychiatry— and we see the problem. The direct damage done by us, by practicing doctors, who see patients mainly for profit is likely on a scale that easily out-Herods any of the harm produced by the pharmaceutical industry.

Restructure Medicare & Medicaid: Most Businesses are Performance-Based, Many Components of Healthcare System are Not

USA Healthcare Outcome (based on Life Expectancy) Have Room For Improvement Relative to Other Countries

Healthcare Spending per capita vs. Average Life Expectancy Among OECD Countries, 2007

[Graph showing correlation between healthcare spending per capita and average life expectancy among OECD countries, highlighting the USA's position compared to other countries like Japan, S. Korea, Mexico, and Hungary.]

Source: OECD.
# Integrated Scientific Curriculum

<table>
<thead>
<tr>
<th>Year</th>
<th>Summer</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Optional prematriculation course</td>
<td>Foundations of Human Bio. Cardiovascular I Pulmonary I Gastrointestinal I</td>
<td>Renal I Musculoskeletal I Mind, Brain, &amp; Behavior I</td>
<td>Endocrinology, Reproduction &amp; Metabolism I Immunology and Hematology Microbiology</td>
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<tr>
<td></td>
<td><strong>Clinical Foundations</strong> (Including clinical skills and professional development curriculum, longitudinal ambulatory externship, case-based learning modules)</td>
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<td><strong>Clinical Transitions</strong> (1 week)</td>
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<tr>
<td>2</td>
<td>Optional exploratory pursuits (e.g., research, clinical outreach)</td>
<td>Principles of Clinical Oncology Epidemiology, Biostatistics &amp; Medical Informatics Musculoskeletal II Gastrointestinal II Endocrinology, Reproduction &amp; Metabolism II Cardiovascular II</td>
<td>Mind, Brain, &amp; Behavior II Pulmonary II Renal II</td>
<td>Multi-Organ System Disorders and Integrative Cases Review (2 weeks) Comprehensive Review and Study for USMLE Step 1 (6 weeks)</td>
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<td>3</td>
<td><strong>Core Clinical Clerkships</strong></td>
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<td>Medicine (12 weeks); Surgery (8 weeks); Pediatrics (8 weeks); Reproductive Medicine (6 weeks); Psychiatry (6 weeks); Neurology (4 weeks); Primary Care (1 afternoon/week throughout year, except during Surgery)</td>
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<td></td>
<td><strong>Clinical Selectives</strong> (2 two-week selectives. One must be in surgery or a surgery-related field)</td>
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<tr>
<td>4</td>
<td><strong>Requirements of 4th year</strong>: 10 months of enrollment: 12 weeks of direct patient care clerkships (1 each of inpatient, outpatient, and primary care) at least 16 weeks of other clinical elective; completion of Independent Study Project.</td>
<td></td>
<td><strong>Principles to Practice</strong> (4 weeks)</td>
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EFFECTS OF INTERMITTENT FASTING ON THE BODY AND BRAIN THAT MAY THwart OBEsITY AND CHRONIC DISEASES

BRAIN
- Improved cognitive function
- Increased neurotrophic factors
- Increased stress resistance
- Reduced inflammation

HEART
- Reduced resting heart rate
- Reduced blood pressure
- Increased stress resistance

LIVER
- Increased insulin sensitivity
- Ketone body production
- Decreased IGF-1 levels

FAT CELLS
- Lipolysis
- Reduced leptin
- Increased adiponectin
- Reduced inflammation

MUSCLE
- Increased insulin sensitivity
- Increased efficiency
- Reduced inflammation

BLOOD
- Decreased insulin, IGF-1, and leptin
- Increased ketones, adiponectin, and ghrelin

INTESTINES
- Reduced energy uptake
- Reduced inflammation
- Reduces cell proliferation

IF Promotes Fat ‘Burning’ and the Production of Beneficial Ketones
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