

# A Universal Actuarial Model to Improve Health and Lower Costs

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# About the speaker



- **Ken Beckman, ASA, ACAS, MAAA, CFA**
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- President & Co-Founder, Actuaries for Sustainable Health Care
- Member of the American College of Lifestyle Medicine Economic Research Consortium

# Walter Kempner, M.D.

- Born in Berlin, emigrated from Germany to USA in 1934
- Clinic at Duke Univ. treated 18,000 patients for 50+ years
- Consistently reversed chronic disease using nutrition in severely ill patients with:
  - malignant hypertension (very high blood pressure)
  - heart disease
  - obesity
  - diabetes/kidney disease
- Provided proof that nutrition could be more effective than conventional treatments (drugs/surgery)
- His restrictive rice and fruit only diet was not adopted by the medical profession to address chronic disease



Walter Kempner, M.D. (1903-1997)

# Chronic (Noncommunicable) Disease



## Current Situation

- Noncommunicable diseases kill 40 million people annually worldwide - 70% of all deaths
- Leading metabolic risk factors for these deaths are:
  - (1) high blood pressure (responsible for 19% of deaths)
  - (2) overweight and obesity (obesity has tripled since 1975)
  - (3) raised blood glucose (diabetics use more than 2X the health care resources than non-diabetics)
- **More than 85% of health care costs attributable to chronic disease (U.S.)**

## Current Strategy

- Focus is on managing conditions through medication compliance/procedures/preventative tests
- Minimal attention given to addressing the underlying cause resulting in reversal or cure

# What if...

A single, low-cost, widely available prescription could prevent and in many cases reverse all of the following:

Cardiovascular (Heart) Disease  
Diabetes  
Obesity / Overweight  
High Blood Pressure  
Osteoarthritis / Rheumatoid Arthritis  
Erectile Dysfunction

Cancer (some forms)  
Constipation/IBS  
Acid Reflux/GERD  
Dementia/Alzheimer's  
Asthma  
Kidney Stones

# The Prescription: Whole Food Plant-Based Nutrition



## Include:

Whole Grains  
Legumes (Beans, Peas, Lentils)  
Vegetables  
Fruits

## Exclude:

Meat (beef, chicken, pork, fish, etc.)  
Dairy products (milk, cheese, yogurt)  
Eggs  
Oils (olive, safflower, canola, coconut, etc.)

- Choose whole foods and avoid refined and processed foods  
(e.g. whole grain bread instead of white bread, olives instead of olive oil)
- No calorie counting required--eat until satisfied and eat when hungry

*"Just eat lots of plant foods; your body will do the math for you."* – T. Colin Campbell

# Why does Whole Food Plant-Based Nutrition work?

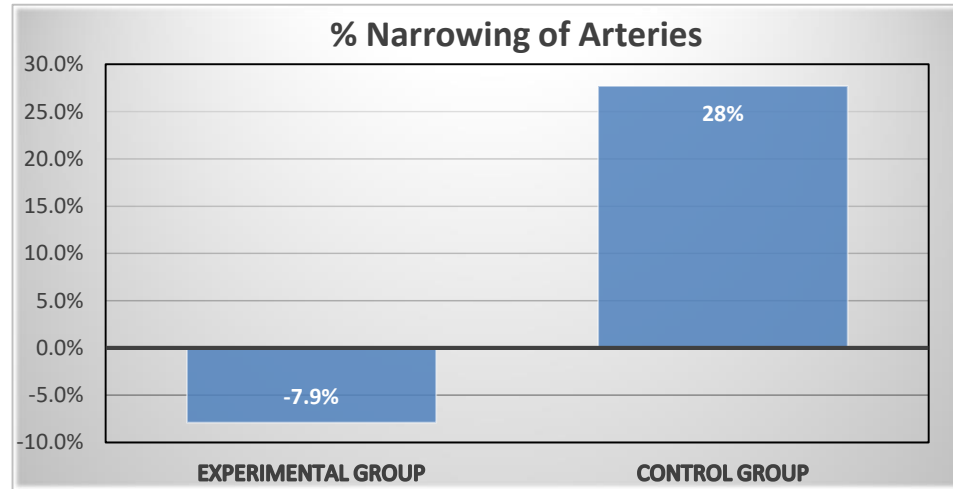
## How is it sustainable?

### CALORIE DENSITY WHAT 500 CALORIES LOOK LIKE



# Dean Ornish, M.D.

## Coronary Artery Disease - 5 year study



Ornish lifestyle medicine program approved by U.S. Medicare in 2010 as a covered service for heart patients as it showed:

- (1) "significant regression" or reversal of coronary atherosclerosis
- (2) reduced the need for bypass or angioplasty
- (3) significant reduction in: LDL cholesterol, triglycerides, body mass index, blood pressure and required medications.

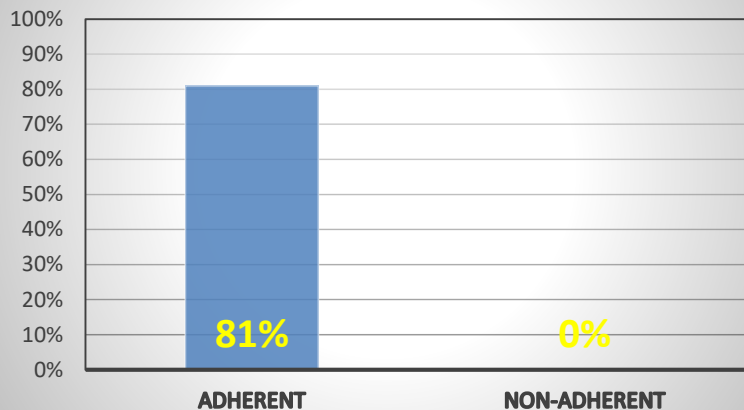


# Caldwell B. Esselstyn Jr., M.D.

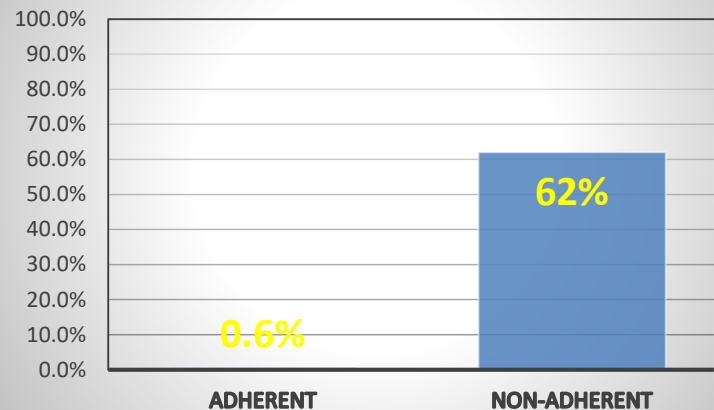
## Cardiovascular (Heart) Disease – study averaged 3.7 years



### % Showing Improvement



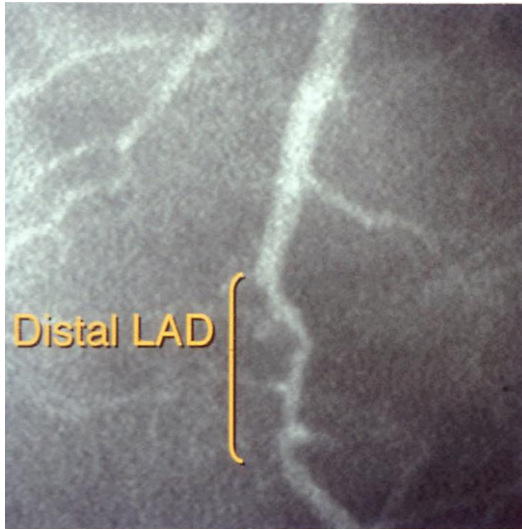
### % with Major Cardiac Events



# Reversal of Coronary Artery Disease

## Caldwell B. Esselstyn Jr., M.D.

27 November 1996

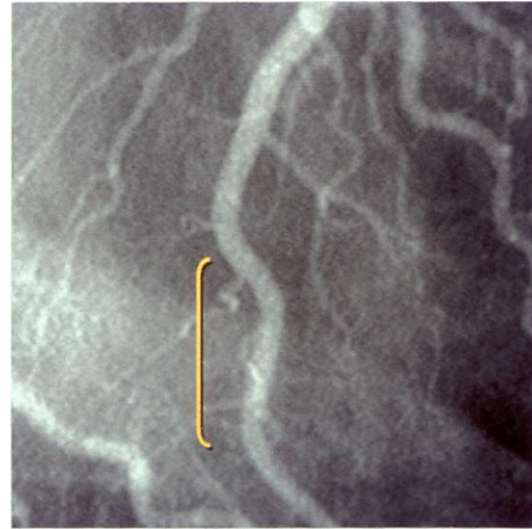
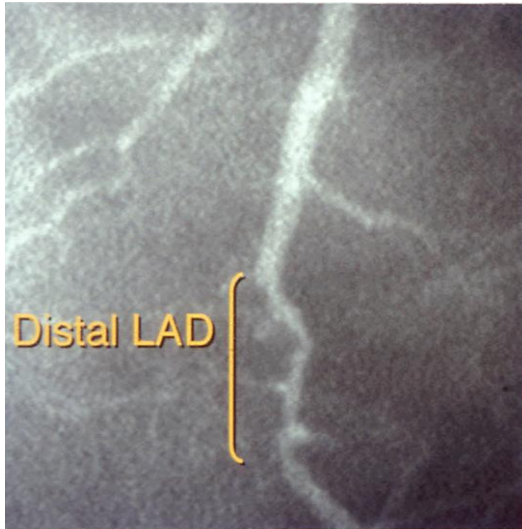


# Reversal of Coronary Artery Disease

## Caldwell B. Esselstyn Jr., M.D.

27 November 1996

22 July 1999



# Dean Ornish, M.D.

## Early Stage Prostate Cancer



|  | Experimental Group | Control Group |
|--|--------------------|---------------|
| PSA (Year 1)                             | -4%                | 6%            |
| Reduced growth of cancer cells (Year 1)  | 70%                | 9%            |
| Required traditional treatments (Year 2) | 5%                 | 27%           |

# John McDougall, M.D.

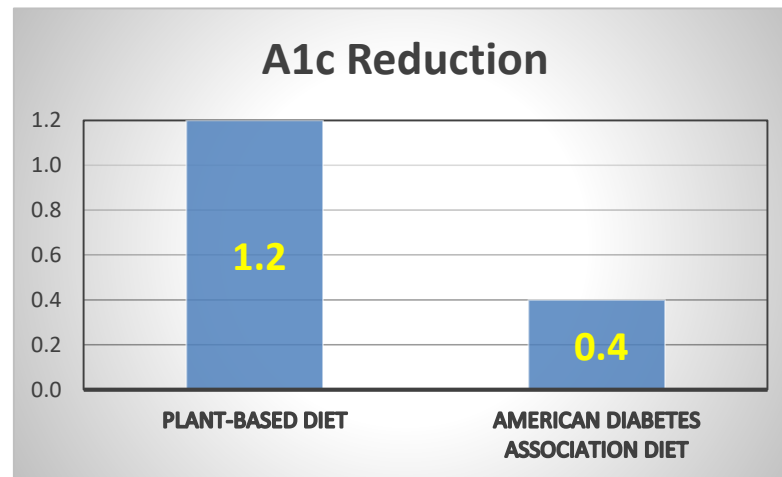
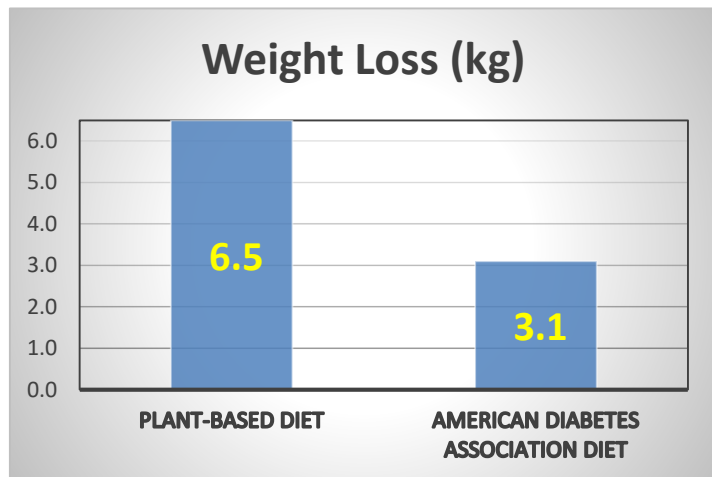
7 day intensive program – 1,600 patients



|   |      |
|---|------|
| Cholesterol                             | -29% |
| Blood Pressure                          | -18% |
| Triglycerides                           | -48% |
| Reduction in Blood Pressure Medications | 86%  |
| Reduction in Diabetes Medications       | 90%  |

# Neal Barnard, M.D.

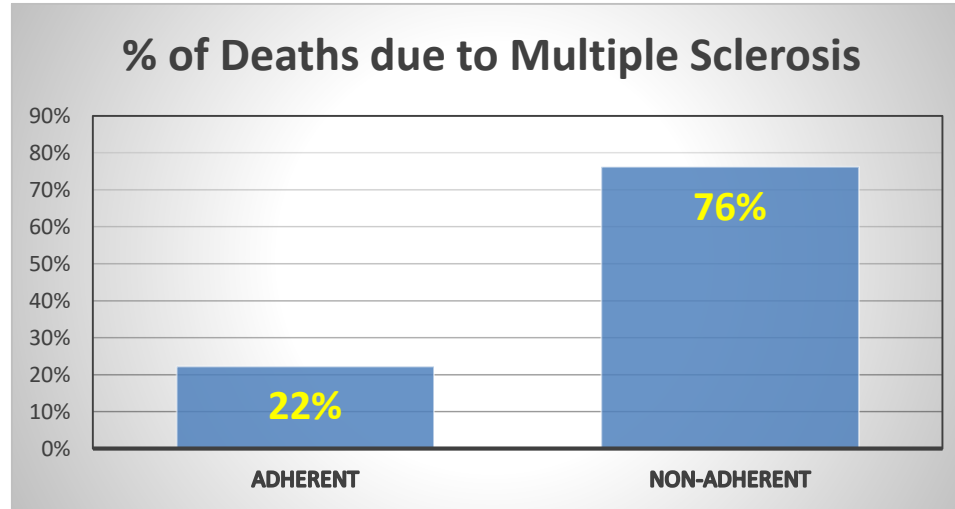
## Diabetes - Randomized Control Trial – 22 week study



- **Satisfaction/compliance higher with plant-based diet -- no limits on calories**
- **Plant-based diet easier to understand compared to one that limited portion sizes**

# Roy Swank, M.D.

Patients with diagnosed Multiple Sclerosis – 34 years of follow up



**Prescribed nutrition was not completely plant-based, but very low in saturated fat (<20g/day)**

# Why should health care providers prescribe Whole Food Plant-Based Nutrition?



| Treatment                        | Effectiveness   | Side Effects   | Cost                          |
|----------------------------------|---|--|-------------------------------|
| Bypass surgery for heart disease | 15%-50% failure rate at 5 years depending on type   | 20% complication rate<br>5% stroke<br>2% death   | \$150,000                     |
| High cholesterol (statin) drugs  | 1.2% reduced risk of death<br>2.6% reduced risk of heart attack<br>0.8% reduced risk of stroke<br>(for those with existing heart disease)<br>[based on absolute risk reduction] | 10% experience muscle damage<br>2% develop diabetes<br>Common: diarrhea, muscle/joint pain, upset stomach.<br>In rare cases: liver dysfunction | \$20/month for life (generic) |
| Diabetes drugs                   | 10% avoid diabetic complications (heart attack, blindness, kidney disease, amputation)<br>5% avoid diabetes-related death<br>[based on absolute risk reduction]                 | 2%-12% experience diarrhea, nausea, vomiting, upset stomach.<br>In rare cases: lactic acidosis   | \$10/month for life (generic) |
| Whole food plant-based nutrition | See previous slides   | More energy, less need for doctor visits and medications   | Free (everyone has to eat)    |

**Adherence rates vary widely, but some drug trials have rates <50% and some plant-based nutrition trials have rates >90%**



# Why is Whole Food Plant-Based Nutrition not being commonly used?



- (1) Fact that most chronic conditions can be reversed is not widely known**
- (2) Lack of monetary incentives for providers to reverse chronic disease**

# Actions That All Health Care Payers Can Implement



## **(1) Deliver a direct message to all insured members**

# Actions That All Health Care Payers Can Implement



## (1) Deliver a direct message to all insured members

### Example: Current Research with an Insurance Company

- Sent introductory letter: *Did you know that diabetes, heart disease, high blood pressure, obesity, arthritis, etc. can be reversed without drugs/surgery and no negative side effects?"*
- Sent documentary film (*Forks Over Knives*) providing the scientific evidence and compelling personal stories of chronic disease reversal
- Provided other materials: book, websites, recipes
- Not prescribing medicine – simply providing (specific, actionable) information and encouraging discussion with health care providers
- Policyholder response / reaction – extremely positive and appreciative
- Claims experience

# Actions That All Health Care Payers Can Implement



- (1) Deliver a direct message to all insured members**
- (2) Require patients be advised of plant-based treatment option before approving payment for non-emergency bypass/stents, bariatric surgery, and PCSK9 drugs**

# Actions That All Health Care Payers Can Implement



- (1) Deliver a direct message to all insured members**
- (2) Require patients be advised of plant-based treatment option before approving payment for non-emergency bypass/stents, bariatric surgery, and PCSK9 drugs**
- (3) Offer financial incentives for physicians/others based on value patients receive (improvement in health)**

# How to Measure Patient Value: Improvement in Health



## **(1) Use Change in Objective Clinical Measures**

- **BMI (Body Mass Index)**
- **Cholesterol**
- **Blood Pressure**
- **HbA1c (Diabetes indicator)**
- **CRP (C-Reactive Protein inflammation marker)**
- **Endothelial function (vascular health indicator)**

## **(2) Relate Measures to Expected Claim Costs (e.g. 1% change in A1c = \$1000 of claim cost)**

# Actuarial Patient Value Model:

## Financial Incentives Based on Improvement in Patient Health



|                                  | Treatment Year |         |         |         |         |
|----------------------------------|----------------|---------|---------|---------|---------|
|                                  | 1              | 2       | 3       | 4       | 5+      |
| Diabetic Patient with HbA1c of:  | 9.0            | 6.5     | 6.5     | 6.5     | 6.5     |
| Expected Total Health Spending:  | \$15,000       | \$7,500 | \$7,500 | \$7,500 | \$7,500 |
| GP/PCP Share of Health Spending: | \$1,500        | \$750   | \$750   | \$750   | \$750   |
| Incentive Payment to GP/PCP:     |                | \$2,000 | \$2,000 | \$2,000 | \$2,000 |
| Net Savings Relative to Year 1:  |                | \$5,500 | \$5,500 | \$5,500 | \$5,500 |

# A Universal Actuarial Model – Implementation



## Different Provider Payment systems (fee-for-service, capitation, salary)

- Existing provider payment systems can remain in place
- Incentives are paid in addition to current reimbursement arrangements

## Different Financing systems (public, private, mixed)

- Private payers can implement Actuarial Patient Value model very quickly working directly with providers
- Public payers may need new legislation/regulation, but as incentive payments are more than offset by reduced spending on health care services overall cost to taxpayer is reduced

## Different clinical settings (primary care, specialist, hospital, nursing home)

- Health care providers can prescribe plant-based treatment, but do not have to create new infrastructure
- Entrepreneurs offer a variety of ways (in-person seminars, online) to educate/support patients who are prescribed plant-based nutrition--sharing incentive payments with referring health care professional



# Why Do Actuaries Need to Get Involved?



- **Evidence & research supports plant-based nutrition, but financial incentive is missing**
- **Experts in developing sustainable financial security systems**
- **Key role with payers—offer payers an evidence-based solution to facilitate large scale implementation**

# Conclusion

**U.S. President John F. Kennedy:**  
**“Lass’ sie nach Berlin kommen”**  
**“Let them come to Berlin”**



Berlin, 26 June 1963

**Thank you!**



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