A Universal Actuarial Model to Improve Health and Lower Costs

Ken Beckman, ASA, ACAS, MAAA, CFA
Central States Indemnity
Omaha, Nebraska, USA
6 June 2018
About the speaker

- **Ken Beckman, ASA, ACAS, MAAA, CFA**
- Vice President & Actuary, Central States Indemnity
- 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
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:

<table>
<thead>
<tr>
<th>Cardiovascular (Heart) Disease</th>
<th>Cancer (some forms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>Constipation/IBS</td>
</tr>
<tr>
<td>Obesity / Overweight</td>
<td>Acid Reflux/GERD</td>
</tr>
<tr>
<td>High Blood Pressure</td>
<td>Dementia/Alzheimer’s</td>
</tr>
<tr>
<td>Osteoarthritis / Rheumatoid Arthritis</td>
<td>Asthma</td>
</tr>
<tr>
<td>Erectile Dysfunction</td>
<td>Kidney Stones</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>OIL</th>
<th>CHEESE</th>
<th>MEAT</th>
<th>POTATOES, RICE, BEANS</th>
<th>FRUITS &amp; VEGGIES</th>
</tr>
</thead>
</table>

...and why whole plant-based foods will help keep you lean and satisfied.

[link to forksoverknives.com]
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

- 81% for Adherent
- 0% for Non-Adherent

% with Major Cardiac Events

- 0.6% for Adherent
- 62% for Non-Adherent
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

Distal LAD

22 July 1999
Dean Ornish, M.D.
Early Stage Prostate Cancer

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA (Year 1)</td>
<td>-4%</td>
<td>6%</td>
</tr>
<tr>
<td>Reduced growth of cancer cells (Year 1)</td>
<td>70%</td>
<td>9%</td>
</tr>
<tr>
<td>Required traditional treatments (Year 2)</td>
<td>5%</td>
<td>27%</td>
</tr>
</tbody>
</table>
John McDougall, M.D.
7 day intensive program – 1,600 patients

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholesterol</td>
<td>-29%</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>-18%</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>-48%</td>
</tr>
<tr>
<td>Reduction in Blood Pressure Medications</td>
<td>86%</td>
</tr>
<tr>
<td>Reduction in Diabetes Medications</td>
<td>90%</td>
</tr>
</tbody>
</table>
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
Patients with diagnosed Multiple Sclerosis – 34 years of follow up

% of Deaths due to Multiple Sclerosis

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?

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

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

<table>
<thead>
<tr>
<th>Treatment Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetic Patient with HbA1c of:</td>
<td>9.0</td>
<td>6.5</td>
<td>6.5</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Expected Total Health Spending:</td>
<td>$15,000</td>
<td>$7,500</td>
<td>$7,500</td>
<td>$7,500</td>
<td>$7,500</td>
</tr>
<tr>
<td>GP/PCP Share of Health Spending:</td>
<td>$1,500</td>
<td>$750</td>
<td>$750</td>
<td>$750</td>
<td>$750</td>
</tr>
<tr>
<td>Incentive Payment to GP/PCP:</td>
<td>$2,000</td>
<td>$2,000</td>
<td>$2,000</td>
<td>$2,000</td>
<td>$2,000</td>
</tr>
<tr>
<td>Net Savings Relative to Year 1:</td>
<td>$5,500</td>
<td>$5,500</td>
<td>$5,500</td>
<td>$5,500</td>
<td>$5,500</td>
</tr>
</tbody>
</table>
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
Contact details:

**Ken Beckman, ASA, ACAS, MAAA, CFA**

address: 1212 N 96 Street
Omaha, NE USA 68114

phone: +1 402-997-8303

mail: kbeckman@csi-omaha.com

web: www.actuariesforsustainablehealthcare.org

Thank you!