Worksite/Corporate Health Programs
Clinical and Cost Outcomes

Kenneth R. Pelletier, PhD, MD
Clinical Professor of Medicine
Clinical Professor of Family & Community Medicine
Professor of Public Health

University of Arizona School of Medicine

University of California School of Medicine, San Francisco
Medical Costs and Corporate Profits

HCFA: By 2030 AD (“Baby Boomers” in 70s and 80s) medical costs at over $16 Trillion or more than 33% GDP

- Schroeder SA, “We can do better - Improving the health of the American people”. NEJM, 357; 12: 2007, p 1221-1228
- Emmanuel, E et al, A systematic approach to containing health care spending. NEJM, August 1, 2012
Breathe deeply and take a quick look at my bill.
Corporate Health Improvement Program (CHIP™)
Corporate Members

• American Specialty Health
• Canyon Ranch Resorts
• Cisco
• Cummins
• Dow
• Exxon Mobil
• Ford Motor Company
• IBM

• Mercer
• NASA
• Optum
• Oracle
• Pepsi
• Pfizer
• Prudential
• Truven
Worksite Disease Management First Study

Gimbel's Department Store, New York City in 1974

Objective: Improve blood pressure by screening asymptomatic, uncomplicated hypertension at the worksite.

Intervention:
- Diagnostic and therapeutic services at work site
- Integration of delivery system with the administration of a labor union
- Adherence to ridged protocol
- Continuous patient surveillance by nurses and paraprofessionals

Results:
- Of 180 employees, 84% were screened and 65% of 186 with confirmed hypertension elected the treatment program.
- Of the 94 patients followed for one year:
  - 97% remained under therapy, with no untoward effect
  - 81% of patients had satisfactory blood-pressure reduction

Corporate Health Improvement Program (CHIP™) Current Research Projects

- **Ford Motor Company** — “An Integrative Medicine Intervention for Back Pain” — Two (2) Year RCT
- **NASA** — “National Assessment of Stress Adaptation” (NASA²) — Two (2) Year Individual and Worksite Assessment and Intervention
- **Prudential** — “Supporting Total Recovery in Valued Employees” (STRIVE) — Two (2) Year “Total Health Management” Intervention with Disabilities
- **University of Arizona School of Medicine and Marino Center** — “Studies in Patient-Based Informatics for Comparative Effectiveness Research” (SPICER) — Three (3) Year Tracking of Patients with 10 most common conditions in an IM Primary Care Clinic
That's odd...my neck suddenly feels better...

EArly Acupuncture
Ongoing Research and Development

- **Green Tea Extract with COPD** – Using a potent green tea extract to restore up to 30% of pulmonary (lung) function in former smoker and/or petrochemically exposed workers

- **Nanotechnology** – Applying “nanotechnology” in an ingested pill to broadcast biomarkers via a wireless, Bluetooth system. This project is focused on newly diagnosed diabetics

- **Epigenesis** – Genetic, biomarker, and psychosocial indicators which are amenable to lifestyle interventions within 10-12 weeks. Focus is on “epigenesis” or changes in genetic markers through lifestyle and environmental influences
System Summary

Foundation 1
Ingestion Sensor

What it identifies
• That a specific pill, tablet or other ingested product (or combination) was ingested.
• Composed and powered entirely from materials found in the daily diet.

Foundation 2
Wearable Sensor

What it senses
• Precise time & identity of ingestions.
• Certain physiologic responses and consumer behaviors over time.
  – HR, HRV, activity, sleep, temperature.
• Acts as communications hub between ingested product and phone.

Foundation 3
Mobile Applications

What it influences
• Consumer reported wellness metrics.
• Correlations between ingestion adherence, patch physiologic measures, and data from other telemetric devices.
• Enable collaboration with clinicians and caregivers.
Tracking Adherence Enables Carers to Identify Patients Who Need Help

**Good Adherer**
A patient who takes pills at the same time everyday. No Intervention needed.

**Poor Adherer**
A patient who skips pills some days and has inconsistent dosing time. Reminders or other interventions may be beneficial.
“I was hoping I could choose my own doctor."
Genetic biomarker selection criteria:

1. Gene biomarkers are stable from one time of testing to the next by the same laboratory. Genes are stable unless there is a specific intervention that alters them;

2. Changes can be made in the expression of these genes by actionable, modifiable, self care lifestyle interventions;

3. Changes can be detected in a maximum time frame of 10-12 weeks although many change in a matter of hours or days; and

4. Are commercially available.
EPIGENESIS: 7 Pillars of Optimal Health

- **Methylation** – Methyl (CH3) molecules with genes on and off to govern DNA expression
- **Inflammation** – Acute vs. chronic and destructive
- **Oxidative Stress** – Excessive oxidation (PON1 and SOD2)
- **Detoxification** – Phase one and Phase two breakdown and excretion of toxins
- **Immunity** – Differentiate self from not self with hypo- and hyper-immunity
- **Lipid Metabolism** – Genetic expressions govern optimal lipid metabolism
- **Mineral Metabolism** – Govern metabolism of nutrients and trace element form whole foods
O Master, is it proper for a monk to use email?

Sure... as long as there are no attachments!
A Review and Analysis of the Clinical and Cost-Effective Outcome Studies of Comprehensive Health Promotion and Disease Management Programs in the Workplace

Kenneth R. Pelletier

AJHP

- March / April 1991: Volume 5, Number 4: 311 – 315
- September / October 1993: Volume 8, Number 1: 50 – 6
- May / June 1996: Volume 10, Number 5: 380 – 388
- July / August 1999: Volume 13, Number 6: 333 – 345

JOEM

- October 2005: Volume 47, Number 10: 1051 – 1058
- July 2009: Volume 51, Number 7: 1051 – 1058
- November 2011: Volume 53, Number 11: 1310 – 1331
Clinical and Cost Outcomes
Return on Investment

SUMMARY

Time Period: 1980 – Present
Number of Studies: 196 Quasi-Experimental
Comparison Groups: 153 Experimental
RCTS: 72 (All since 1992)
Longitudinal: 6 Months to 12 Years

All studies demonstrated clinical benefits
Cost effect, cost benefit, and/or ROI: 91 of 92
MY MIND AND MY BODY HATE EACH OTHER!
Health Affairs ROI Literature Review


ABSTRACT Amid soaring health spending, there is growing interest in workplace disease prevention and wellness programs to improve health and lower costs. In a critical meta-analysis of the literature on costs and savings associated with such programs, we found that medical costs fall by about $3.27 for every dollar spent on wellness programs and that absenteeism costs fall by about $2.73 for every dollar spent. Although further exploration of the mechanisms at work and broader applicability of the findings is needed, this return on investment suggests that the wider adoption of such programs could prove beneficial for budgets and productivity as well as health outcomes.

3.21 : $1.0 ROI
HERO II:

Difference in Medical Expenditures: High-Risk vs. Lower-Risk Employees
“Bottom Line” on the “Bottom Line”

- All worksite interventions (N=219) indicate positive clinical/health outcomes
- All demonstrated related benefits (monetize) in STD, LTD, absenteeism, retention, productivity, performance, and/or presenteeism
- Cost effectiveness, cost benefit, and/or ROI is positive in 155 of the 156 studies analyzed for financial outcomes
- Out of the 155 studies reporting financial outcomes, 93 reported ROI and all were positive
- Vast majority of all cost effectiveness studies and literature reviews demonstrate positive ROI
- In the more rigorous studies/interventions the ROI tends to be lower
- Most conservative ROI estimate is 1:1 (Break Even) to 2:1
- Evidence based ROI range: Approximately 3.5-4.90 : 1
- ROI outcomes most evident at approximately 3.25 years
The Link Between Workforce Health and Safety and the Health of the Bottom Line

Tracking Market Performance of Companies That Nurture a “Culture of Health”

Raymond Fabius, MD, R. Dixon Thayer, BA, Doris L. Konicki, MHS, Charles M. Yarborough, MD, Kent W. Peterson, MD, Fikry Isaac, MD, Ronald R. Loeppke, MD, MPH, Barry S. Eisenberg, MA, and Marianne Dreger, MA

Objective: To test the hypothesis that comprehensive efforts to reduce a workforce’s health and safety risks can be associated with a company’s stock market performance. Methods: Stock market performance of Corporate Health Achievement Award winners was tracked under four different scenarios using simulation and past market performance. Results: A portfolio of companies recognized as award winning for their approach to the health and safety of their workforce outperformed the market. Evidence seems to support that building cultures of health and safety provides a competitive advantage in the marketplace. This research may have also identified an association between companies that focus on health and safety and companies that manage other aspects of their business equally well. Conclusions: Companies that build a culture of health by focusing on the well-being and safety of their workforce yield greater value for their investors.

Recently, an article by Loeppke and colleagues, reported that for every dollar of medical and pharmaceutical costs spent, an employer lost an additional $2.30 of health-related productivity costs. Health-related presenteeism (health risks and medical conditions impacting work performance) was shown to have a larger impact on lost productivity than absenteeism, with executives and managers suffering higher losses. Comorbidities demonstrated the largest effects on productivity loss.

These facts led to a hypothesis: Companies that create an environment for their employees and dependents that reinforces both conscious and unconscious safer and healthier lifestyle choices as well as provides more effective accessing of appropriate health care (ie, surround them with a “culture of health”) should be more productive and that productivity should drive business performance and...
ACOEM Winners

Figure 1. Portfolio starting at five winners versus S&P 500.
HealthNEXT Research—Birthing a Culture of Health Index

Out Performing the S&P 500 (2009 – Present)

- Created a stock portfolio based on the key learning from the HealthNEXT Employer Health Opportunity Assessment (EHOA) scorecard
- Invested $400,000 into the portfolio of approximately 30 publicly traded companies; using a scoring criteria to weight & unweight the portfolio based on employer score
- Back-casted to 2001
- Again, this portfolio has consistently outperformed the market by magnitudes; in both good times and bad
A preponderance of mounting evidence that cultures of health provide a competitive advantage

“Though correlation is not the same as causation, the results consistently and significantly suggest that companies focusing on the health and safety of their workforce are yielding greater value for their investors as well. More research needs to be done to better understand the value of building these “cultures of health” in the workplace. Perhaps such efforts as this simply identify “smart” companies that out-perform. But the evidence appears to be building that healthy workforces provide a competitive advantage in ways that benefit their investors.”
FIGURE 4. Portfolio excluding outliers versus S&P 500
"I'll have an ounce of prevention."
KOOP Award Winners and S&P 500 Index

The mission of The Health Project (THP) is to seek out, evaluate, promote, and disseminate information about exemplary health promotion and disease prevention programs with demonstrated effectiveness in improving population health and producing net savings.
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Symbol</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP America</td>
<td>BP</td>
<td>2014</td>
</tr>
<tr>
<td>Eastman Chemical</td>
<td>EMN</td>
<td>2011</td>
</tr>
<tr>
<td>Prudential Financial</td>
<td>PRU</td>
<td>2011</td>
</tr>
<tr>
<td>Pfizer, Inc.</td>
<td>PFE</td>
<td>2010</td>
</tr>
<tr>
<td>The Volvo Group</td>
<td>VOLVF</td>
<td>2010</td>
</tr>
<tr>
<td>Alliance Data Systems Corp</td>
<td>ADS</td>
<td>2009</td>
</tr>
<tr>
<td>Dow Chemical Company</td>
<td>DOW</td>
<td>2008</td>
</tr>
<tr>
<td>International Business Machines</td>
<td>IBM</td>
<td>2008</td>
</tr>
<tr>
<td>Pepsi Bottling Group</td>
<td>PBG</td>
<td>2007</td>
</tr>
<tr>
<td>WE Energies</td>
<td>WEC</td>
<td>2007</td>
</tr>
<tr>
<td>Union Pacific Railroad</td>
<td>UNP</td>
<td>2005</td>
</tr>
<tr>
<td>UAW-GM</td>
<td>GM</td>
<td>2004</td>
</tr>
<tr>
<td>Johnson &amp; Johnson Services, Inc.</td>
<td>JNJ</td>
<td>2003</td>
</tr>
<tr>
<td>FedEx Corp.</td>
<td>FDX</td>
<td>2002</td>
</tr>
<tr>
<td>Motorola Solutions Inc.</td>
<td>MSI</td>
<td>2002</td>
</tr>
<tr>
<td>Citibank</td>
<td>C</td>
<td>2001</td>
</tr>
<tr>
<td>Union Pacific Railroad</td>
<td>UNP</td>
<td>2001</td>
</tr>
<tr>
<td>Northeast Utilities</td>
<td>NU</td>
<td>2001</td>
</tr>
<tr>
<td>Caterpillar Inc.</td>
<td>CAT</td>
<td>2000</td>
</tr>
<tr>
<td>Cigna Corp.</td>
<td>CI</td>
<td>2000</td>
</tr>
<tr>
<td>DaimlerChrysler Corporation</td>
<td>DDAIF</td>
<td>2000</td>
</tr>
<tr>
<td>Fannie Mae</td>
<td>FNMA</td>
<td>2000</td>
</tr>
<tr>
<td>Aetna</td>
<td>AET</td>
<td>1999</td>
</tr>
<tr>
<td>Pfizer, Inc.</td>
<td>PFE</td>
<td>1999</td>
</tr>
<tr>
<td>Glaxo Wellcome</td>
<td>GSK</td>
<td>1999</td>
</tr>
<tr>
<td>UNUM/ Provident</td>
<td>UNM</td>
<td>1999</td>
</tr>
</tbody>
</table>

- S&P 500: 150%
- Koop Winners: 350%
That's all for now folks!
Corporate Health Improvement Program (CHIP)

• Develop and Evaluate Innovative Health and Medical Programs in Corporate Worksites
• “Town Gown” Projects with “Evidence Based” RCTs
• Managed Care with Clinical and Cost Outcomes
• Utilization Review and Medical Outcomes
• Health Promotion, Disease Management, and Integrative Medicine
Health Management ROI Programs

Literature Review Results

- ROI for components of care management range in degree of return and timing of return for comprehensive worksite HP/DM programs (N=25)
- Program impact varies based on:
  - Communication approach
  - Incentives/Engagement strategy
  - Population/Organizational demographics
  - Funding arrangement (fully or self-insured)
- Savings and ROI estimates are based on programs in place 2-3 years

<table>
<thead>
<tr>
<th></th>
<th>Comprehensive WHP</th>
<th>Disease Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Percent Cost Avoidance of Total Claims Cost</td>
<td>2% – 4%</td>
<td>2% – 4.5%</td>
</tr>
<tr>
<td>Average ROI – Healthcare only</td>
<td>1.5:1 – 3.0:1</td>
<td>1.2:1 – 1.8:1</td>
</tr>
<tr>
<td>Average ROI – Healthcare and Productivity</td>
<td>3.0:1 – 5.0:1</td>
<td>2.5:1 – 3.5:1</td>
</tr>
</tbody>
</table>

“The results of these reviews indicate that ‘Assessment of Health Risk with Feedback’ is useful as a gateway intervention to a broader worksite health promotion program that includes health education lasting ≥1 hour or repeating multiple times during 1 year, and that may include an array of health promotion activities.”
Ten Modifiable Health Risk Factors Are Linked To More Than One-Fifth Of Employer-Employee Health Care Spending

By Ron Z. Guadet, Klaudia Pol, Maryjo J. Fabi, Rachel M. Haims, Nogolana Ramasace, Craig F. Nelson, and R. Douglas May

ABSTRACT: An underlying premise of the Affordable Care Act provisions that encourage employers to adopt health promotion programs is an association between workers' modifiable health risks and increased health care costs. Employers, consultants, and vendors have cited risk-cost estimates developed in the 1990s and wondered whether they still hold true. Examining ten of these common health risk factors in a working population, we found that similar relationships between such risks and total medical costs documented in a widely cited study published in 1998 still hold. Based on our sample of 32,086 employees at seven organizations over an average of three years, $82,072,496, or 24.4 percent, of the $356,733,301 spent annually by the seven employers and their employees in the study was attributed to the ten risk factors studied. This amount was similar to almost a quarter of spending linked to risk factors (24.9 percent) in the 1998 study. High risk for depression remained most strongly associated with increased per capita annual medical spending (68 percent, or $2,186 higher), high blood glucose, high blood pressure, and obesity were strongly related to increased health care costs (31.8 percent, 31.6 percent, and 27.4 percent higher, respectively), as were tobacco use, physical inactivity, and high stress. These findings indicate ongoing opportunities for well-designed and properly targeted employer-sponsored health promotion programs to produce substantial savings.

Section 4303 of the Affordable Care Act of 2010 and section 2795 of the Public Health Service Act of 1870, which was amended by the Affordable Care Act, contain provisions that encourage employers to adopt health promotion and risk reduction programs, also known as wellness programs. The underlying premise of these provisions is that modifiable health risk factors, such as stress, poor diet, and high blood pressure, are associated with increased health care costs in the employed population. Therefore, employers that offer wellness programs may save on health care expenditures. The largest employer-based study that supported the association between higher health risks and higher health care costs that are now 25 years old. Also, both personal health behaviors and health care services have changed since the preliminary study. The goal of this study was to ascertain the current association using more current data. In doing so, we demonstrate that the relationships shown more than a decade ago between employees' health risks and subsequent health care costs still hold today. These findings indicate ongoing opportunities for well-designed and properly targeted employer-sponsored health promotion programs to produce substantial savings.
What is the Evidence Base?

A large proportion of diseases and disorders is preventable. Modifiable health risk factors are precursors to a large number of diseases and disorders and to premature death (Healthy People 2000, 2010, Amler & Dull, 1987, Breslow, 1993, McGinnis & Foege, 1993, Mokdad et al., 2004)


Improvements in the health risk profile of a population can lead to reductions in health costs (Edington et al., 2001, Goetzel et al., 1999, Carls et al., 2011))

Marketplace rewards companies who achieve cultures of health

- Used the ACOEM Corporate Health Achievement Award (CHAA) culture of health award winners as a stock portfolio
- A portfolio of approximately twenty publicly traded award winners; over nearly two decades
- Published September 2013 in the *JOEM*
- Once again the portfolio out performed the market significantly; in all four test scenarios.
Markedly Out-performs the S&P 500 Index when purchased the month of winning
ROI “Best In Class” (1999)

ROI Studies of Intervention Programs at:

- Canada and North American Life
- Chevron Corporation
- City of Mesa, Arizona
- General Mills
- General Motors
- Johnson & Johnson
- Pacific Bell
- Procter and Gamble
- Tenneco

Results:

- Sample sizes ranged from 500 – 50,000 employees
- ROI estimates in 9 studies ranged from 1.40 – 4.90: 1 in savings per dollar expended
- Median ROI was 3:1

Ref: Goetzel, Judy, and Ozminkowski: AWHP’s Worksite Health, Summer 1999, pp. 12-21