LEVERAGING THE TOOLS OF TECHNOLOGY WITH THE POWER OF PREVENTION

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Overview

• Delineate the Converging Trends that are advancing Workplace Wellness initiatives with Wireless Technology

• Evaluate the potential for leveraging the wireless health ecosystem in the delivery of more effective population health management

• Discuss the solid Business Case for why employers should invest in wellness and prevention strategies.

• Examine the Top 5 Leading Attributes of how to build Successful Workplace Wellness programs.

• Analyze a Case Study of leveraging technology with a comprehensive, wellness & prevention initiative with published results
Converging Trends Driving Workplace Wellness in the context of Mobile Health and Wireless Technology

• Epidemiological Trends

• Political Trends

• Cultural Trends

• Financial Trends
Converging Trends Driving Workplace Wellness in the context of Mobile Health and Wireless Technology

Epidemiological Trends:

- The Age Wave—Silver Tsunami about to hit the healthcare system
- Compression of Morbidity
When the Age Wave Hits the Shore: Implications for Caring for Aging Baby Boomers
The Age Wave on the Beachhead of the Healthcare System

- 10,000 Baby Boomers turning 65 every day…
- 73% of Boomers working past 65
- Population over 65 will increase from 12.9% in 2005 to 20% in 2030
Personal Health Behaviors are the main Causes of Death

Health Behaviors: The Main Mortality Risk Factors in U.S.

- Lifestyle: 51%
- Heredity: 20%
- Environment: 19%
- Health Services: 10%

Compression of Morbidity

Live Healthier Longer and Die more Suddenly at Lower Cost

“Sudden Death in Overtime”

The compression of morbidity relates to postponing the age of onset of morbidity, disability and cumulative health costs—even though life expectancy is increased—largely by reducing health risks.

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Political Trends:
  • Bipartisan Support for Prevention
  • Aligning Incentives among Consumers, Providers and Purchasers
  • Prevention Related Elements in Health Reform Legislation
Prevention Related Elements in Health Reform Legislation
Focusing on the “Health” in Health Reform Legislation

- National Prevention, Health Promotion & Public Health Council creating a National Prevention Strategy (Sec. 4001)

- Prevention and Public Health Fund (Sec. 4002)

- Grants for Small Businesses to Provide Comprehensive Workplace Wellness Programs (Sec. 10408)

- Wellness Programs Incentives for Employees (Sec 2705)
NBGH 2012 Employer Survey

• A survey of 139 employers from Fidelity and the National Business Group on Health to analyze the growth of health-improvement programs in the workplace.

• The survey finds that almost three out of four (73%) companies used incentives in 2011 to engage employees in health-improvement programs and the average incentive value was $460.

• That incentive value figure has steadily increased from an average of $260 in 2009.
Focusing on the “Health” in Health Reform Legislation

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• Accountable Care Organizations (ACOs)

• Patient Centered Medical Homes (PCMHs)
ACOs/PCMH Definitions

- Accountable Care Organizations (ACOs)
  - Care model that makes physicians and hospitals more accountable
  - Outcomes-oriented, performance-based with aligned incentives
  - Goal: improve value of health services, control costs, improve quality
  - ACOs share in a portion of any savings gained

- Patient Centered Medical Home (PCMH)
  - “Whole-person” and “Whole Population” orientation
  - Integrated and Coordinated Care
  - More emphasis on quality, safety, better access to physicians
  - Aligned incentives for improving health as well as better clinical outcomes
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Cultural Trends:
- Wellness is the new Green: The Ultimate Personal Sustainability
- Wireless, mHealth & eHealth Innovations in Wellness
Social Networking in Healthcare

- Patients Like Me
- Livestrong
- Social influences drive behavior adoption
Gamification in Healthcare

• Since 2004 One Game has been played 50 Billion hours (5.93 Million Years)

• 183 M people are “Gamers” (> 13 hours per week)

• 97% of Youth play regularly

• 25% of > 50 y/o play regularly

• “Transformational Accomplishment can occur when we can celebrate Spectacular Failure”

• Nobel Prize in the future?

• Games for health annual conference
Gamers Succeed Where Scientists Fail: Molecular Structure of Retrovirus Enzyme Solved, Doors Open to New AIDS Drug

• Science Daily (Sep. 19, 2011) — Gamers have solved the structure of a retrovirus enzyme whose configuration had stumped scientists for more than a decade.

• The gamers achieved their discovery by playing Foldit, an online game that allows players to collaborate and compete in predicting the structure of protein molecules.

• They did it in only three weeks.

• The Center for Game Science, in the Department of Computer Science and Engineering at the University of Washington, is where gamers, students, scientists and scholars apply gaming principles and play games (like Foldit) to innovate breakthroughs in fields as diverse as biology, education and nanotechnology.
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• Mobile/Wireless Technology Transforming the Healthcare Industry
Burgeoning Fields

• eHealth - Heterogeneous and evolving digital resources and practices that support health and health care” and delineates an emerging field of study encompassing multiple disciplines (Office of Disease Prevention and Health Promotion, 2006, p.xi).

• Wireless Health – Health field that uses tools that are able to receive and transmit health data using various technologies (Radio Frequency, Bluetooth, Wireless Routers, Cellular).

• mHealth – mHealth is the use of mobile and wireless devices to improve health outcomes, healthcare services and health research (HRSA, 2012).
More people have access to cell phones than drinking water, electricity or a toothbrush.

Mobile devices have overtaken worldwide population.*

Mobile Health Technology at a Glance

• There are currently over 40,000 mobile health applications available and 247 million individuals have downloaded at least one to their mobile device (Jahns & Gair, 2012)

• 88% of physicians want patients to track or monitor their health at home. (PricewaterhouseCoopers HRI Physician Survey, 2010)

• The typical adult checks their smartphone at least 30 times each day (Oulasvirta, Rattenbury, Ma & Raita, 2011).

• 54% of 48-53-year olds will download a wellness app
By 2020, ~160 million Americans monitored and treated remotely for at least one chronic condition

Need for Diabetes Prevention/Care in United States

79 million Americans have PRE-DIABETES
- 73 million are UNAWARE
  - Goal: Reduce or Eliminate Risk Factors and Avert Disease
- 24 million Americans have DIABETES
  - 7 million are UNDIAGNOSED
    - Goal: Find and Treat Disease in Its Earliest Stages to Stop Its Progression
  - 17 million of those are DIAGNOSED
    - Goal: Manage Disease to Avoid Complications and Disease Progression
  - 13 million of those are TREATED
    - Goal: Manage Disease to Avoid Complications and Disease Progression
  - 5.2 million have their disease CONTROLLED
    - Goal: Avert Onset of Diabetes or Costs due to Untreated or Uncontrolled Disease

18.8 million have Diabetes that is NOT CONTROLLED

Sources: NIH, CDC.
Example of Diabetes Mobile Manager Application

Check your feet every day for cuts, blisters, red spots, swelling, and sore toenails. If you have trouble bending over to see your feet, use a plastic mirror or ask a family member or caregiver to help.

Learn more:
National Diabetes Education Program
Diabetes Well-being Manager: Physician Summary Report

- Glucose
  - Target Range
  - % on Target
  - Highest/Lowest reading
  - Avg Glucose overall
  - Avg pre/post meal glucose
- Weight
  - Current + Goal
- Exercise
  - Avg weekly minutes
  - Goal
  - Most frequent activity
- Nutrition
  - Avg calories+carbs / day
- Medication
  - Current List
  - # missed doses
  - % adherence
- Diabetes Well-being Checklist Items
- Diabetes Well-Being Score
“Apps that can assess data like blood glucose levels, diet and drug regimen — and can be reimbursed by insurance — will soon be prescribed by doctors to help treat patients…

…If smartphone-based systems can reduce the amount of other medical care that patients need, the potential benefit to the health care system would be enormous; the total cost of treating diabetes alone in 2007 was $174 billion, according to the most recent statistics from the Centers for Disease Control and Prevention.”
Prescription Apps - Wireless Engagement

• Poised to transform healthcare as we know it

• Effective channel to deliver behavior change interventions to large groups at lower costs (Noar & Harrington, 2012)

• Perpetual Connectivity/Communication
  • Information into Knowledge
  • Reminders/Notifications
  • Knowledge into Action
  • Clinical and Social support
  • Action into Results

• Always with you, always on
Traditional Engagement

- Mailings
  - Population transience
  - Asynchronous interaction
  - Targeted and specific can be useful
- Telephonic
  - Smile and dial – reach rates
  - Left messages
- Face-to-face
  - Most expensive though usually most effective
- Effectiveness varies – Obesity and sedentary lifestyles still rising
Changing Behavior

• The key is how do you get someone to make a healthy choice when faced with a decision?

• Health Behavior Theories
  • Necessary since engagement is about taking action

• Efficacy-building
  • Mastering tasks
  • Learning from others
  • Social supports
  • Overcoming negative feelings
Future tech
Contextual Engagement

- Contextual
  - Where am I?
  - What am I doing?
  - “checking in”
- Kairos – The opportune moment (Fogg, 2007)
- Location-based reminders
- GPS enabled “healthy restaurants” search
- Glucometer readings at the gym
Interstitial time

- Short bursts of attention
- Tracking and self-monitoring
- Wireless tools and apps should consider in development
- Tasks should be simple and quick
Don’t forget the “F” word

• FUN!

• Health related games effective at teaching condition self-management

• Ongoing debate about whether some exergames generate energy expenditures needed to promote health
Rapid Proliferation ≠ Efficacy

See how healthy your lungs are -- just blow into your phone

by Elizabeth Armstrong Moore September 19, 2012

Researchers in Seattle develop a new tool to monitor lung health that doesn't require new hardware. All users need is a smartphone.

Today, patients with chronic lung conditions such as cystic fibrosis or asthma can't easily monitor how their airways are doing. Instead, they have to go to the doctor's office and blow into a special device called a spirometer as hard and fast as they can.

So for the past two-plus years, grad students at the University of Washington in Seattle have been working to develop an app that can measure lung function just as accurately but without the need for additional hardware. (Existing apps either require hardware or are for entertainment purposes only.)

In other words, they've been trying to turn a smartphone into a spirometer.
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- Wireless Technology Transforming the Healthcare Industry

Financial Trends
- The Problem: The Cost Crisis is due in large part to the Health Crisis
Patients with chronic diseases account for 75% of U.S. healthcare costs

Of the $2 trillion spent on U.S. health care

Of every dollar spent...

...75 cents went towards treating patients with one or more chronic diseases

In public programs, treatment of chronic diseases constitute an even higher portion of spending:

More than **96 cents** in Medicare...

...and **83 cents** in Medicaid

“The United States cannot effectively address escalating health care costs without addressing the problem of chronic diseases.”

-- Centers for Disease Control and Prevention
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- The Problem: The Cost Crisis is due in large part to the Health Crisis
- The Bigger Problem: Total Cost Impact of Poor Health to Employers
Health and Productivity (Absenteeism / Presenteeism) are inextricably linked
The Bigger Problem: The Full Cost of Poor Health

**Personal Health Costs**
- Medical Care
- Pharmaceutical costs

**Productivity Costs**

**Absenteeism**
- Short-term Disability
- Long-term Disability

**Presenteeism**
- Overtime
- Turnover
- Temporary Staffing
- Administrative Costs
- Replacement Training
- Off-Site Travel for Care
- Customer Dissatisfaction
- Variable Product Quality

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Financial Trends
- The Problem: The Cost Crisis is due in large part to the Health Crisis
- The Bigger Problem: Total Cost Impact of Poor Health to Employers
- The Solution: Evidence Based Preventive Medicine/Workplace Wellness
Evidence-Based Preventive Medicine is a Key Solution

Centers for Disease Control and Prevention has found that:

• 80% of Heart Disease and Type II Diabetes as well as

• 40% of Cancer are *Preventable*

  – if people just:
    » stopped smoking,
    » ate healthy and
    » exercised
Health is not a Spectator Sport

"Give it to me straight, Doc. How long do I have to ignore your advice?"
Evidence-Based Prevention

Primary Prevention

- HEALTH PROMOTION
  - Wellness Programs
  - Health Risk / Lifestyle Modification
  - Web Tools/Programs
  - Health Coach 24/7

Secondary Prevention

- EARLY DETECTION
  - Disability Prevention Screening (USPTF)
  - Biometric Testing
  - Health Coach 24/7

Tertiary Prevention

- EARLY INTERVENTION
  - SAW/RTW Programs
  - Common Chronic EBM Condition Mgmt
    (Depression/Diabetes)
  - Case Management

15% members = 85% cost

85% members = 15% cost

Potentially Disabling Conditions
Key Attributes of Successful Workplace Wellness Strategies

- 3 C’s - Culture, Communication & Cash (Incentives)
- Whole Population/Whole Person Integrated Health Strategies
- Integration of health related initiatives across health promotion (wellness) and health protection (safety)
- Measurement/Evaluation, beyond just financial ROI to VOI (Value of Investment)
Beyond ROI to the Full Value of the Investment in Health

**ROI**

Return on Investment
Financial Indicators/Net Savings

**VOI**

Value of Investment
Financial Indicators/Net Savings
- Participation Indicators
- Engagement Indicators
- Preventive Screening Indicators
- Health Risk Indicators
- EBM Clinical Indicators
- Utilization Indicators
- Performance Indicators
- Shareholder Value

The Business Value of Better Health and Productivity

- Market cap value impact from regaining 1 Day of productivity per year per FTE
- 58,000 employees, current 8 Days per FTE of health-related productivity loss

1 Day per FTE of Regained Productivity = 

$18.8M EBITDA impact

13x (EBITDA Multiple)

$244.4M estimated market cap increase

÷ 292M shares

$0.84 in additional per share value

Published Study: Impact of Prevention on Risk Reduction

Study Cohort Population Health Risk Transitions (1 Year)

N = 2,606

YEAR 1

Study Cohort Individual Risk Reductions (after 1 Year on Plan)

Key Individual Risk Reduction Cohorts

<table>
<thead>
<tr>
<th>% Decrease in High Risk</th>
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<tbody>
<tr>
<td>Blood Pressure</td>
</tr>
<tr>
<td>Fasting Blood Sugar</td>
</tr>
<tr>
<td>Stress</td>
</tr>
<tr>
<td>Perception of Health</td>
</tr>
<tr>
<td>Alcohol</td>
</tr>
<tr>
<td>Cholesterol</td>
</tr>
<tr>
<td>Physical Activity</td>
</tr>
<tr>
<td>Health Related Illness Days</td>
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<tr>
<td>Fatty Diet</td>
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</tbody>
</table>

Significantly reduced key health risks.

Stages of Engagement Defined

Engagement Criteria:

Stage I(a) Engagement – HRA + Labs + 1 Login  
(Personalized Prevention Plan Web based Engagement)

Stage I(b) Engagement – HRA + Labs + 2 to 4 Logins  
(Personalized Prevention Plan Web based Engagement)

Stage I(c) Engagement – HRA + Labs + 5 or more Logins  
(Personalized Prevention Plan Web based Engagement)

Stage II Engagement – HRA + Labs + 1 or more Action Programs and/or Challenges (No Live Coaching)  
(Virtual Coaching Engagement and/or Social Engagement)

Stage III(a) Engagement – HRA + Labs + 1 or more Live Coaching Contact (No Action Program/Challenge )  
(Live Coaching Engagement)

Stage III(b) Engagement – HRA + Labs + 1 or more Action Program/Challenge + 1 or more Live Coaching Contact  
(Live Coaching plus all other Engagement)

### Population Health Risk Reduction (%) by Stage of Engagement

<table>
<thead>
<tr>
<th>Stage of Engagement</th>
<th>% of Health Risks Reduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Flow</td>
<td>15.77%</td>
</tr>
<tr>
<td>Stage I(a)</td>
<td>18.11% (ns)</td>
</tr>
<tr>
<td>Stage I(b)</td>
<td>21.97% (p&lt;.0001)</td>
</tr>
<tr>
<td>Stage I(c)</td>
<td>23.75% (p&lt;.0001)</td>
</tr>
<tr>
<td>Stage II</td>
<td>20.74% (p&lt;.0001)</td>
</tr>
<tr>
<td>Stage III(a)</td>
<td>25.63% (p&lt;.0001)</td>
</tr>
<tr>
<td>Stage III(b)</td>
<td>30.05% (p&lt;.0001)</td>
</tr>
<tr>
<td>Total Average</td>
<td>22.80% (p&lt;.0001)</td>
</tr>
</tbody>
</table>

Reduced Risk → Reduced Cost

Average Saving (per Risk Reduced per person per year)

Costs

Increased

$800
$400
$200
$0

< $200
< $400
< $800

Risks Reduced
Risks Increased

Reduced Risk → Improved Productivity

Average Productivity Savings (per Risk Reduced per person per year)

$950 Risk/Year

% of Productivity Change

-2% -2%

0% -1

2% 0

4% 6%

# of Health Risk Changes

Wellness Works and Prevention Pays

Workplace Wellness Programs Can Generate Savings

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 theockal adoption of such programs could prove beneficial for budgets and productivity as well as health outcomes.

In an environment of soaring health care spending, policymakers, businesses, and employees express growing interest in methods of improving health while lowering costs. Much discussion has taken place about investment in disease prevention and health promotion as a way of achieving better health outcomes at lower costs. President Barack Obama has highlighted prevention as a critical component of health reform, as have major congressional reform proposals. Work-place-based wellness programs, which could affect prevention, have been showcased in these reform proposals, the popular press, and congressional hearings.

This enthusiasm for workplace programs stems in part from the fact that more than 50 percent of Americans get their health insurance coverage through an employer-based plan, as well as from the recognition that many employees spend the majority of their working lives in the workplace. These factors make workplace wellness programs attractive for employers, and there is considerable pressure from employees for investments in health. There are several reasons that employees might benefit from investments in employer wellness. First, such programs might lead to reductions in health care costs and thus health insurance premiums. Second, healthier workers might be more productive and miss fewer days of work. These benefits may accrue at least partially to the employer (such as through improved ability to attract workers), even if the primary benefits accrue to the employee.

These factors may motivate the increasing interest in such programs among employers—and especially large employers. In 2006, 39 percent of companies with 100 or more employees offered wellness programs, while a 2008 survey of large manufacturing employers reported that 77 percent offered some form of health and wellness programs. Consistent with the evidence presented here, small firms are slower to offer such programs, and a recent study of large employers found that for every dollar invested in the programs, the employer saved more than the dollar spent. The California Public Employees Retirement System (CalPERS), Bank of America, and Johnson & Johnson have similarly estimated sizable health care savings through wellness programs. Despite