

A. Reduced Medical Claims

1992 health benefit claims were evaluated to establish benchmark levels of lifestyle and behavioral related costs for NU's population. Findings of this audit showed that 17% (\$8,000,000) of NU's 1992 health care dollars were being spent on lifestyle and behavioral related claims. Approximately \$5,000,000 was determined to be modifiable. As a result, WellAware was conceived and implemented during 1994. Formal financial savings projections were established and approved prior to its implementation.

After 24 months of WellAware programming, 1996 claims were analyzed to answer two questions:

1. Is the WellAware program producing positive financial results?
2. What are the future expectations related to WellAware's financial performance?

In evaluating the effects of WellAware on 1996 claims, three areas of primary analysis were identified:

- Does the program produce a positive ROI? If so, how positive?
- Has the program performed as expected? Are savings estimates consistent with actual health claims experience?
- Have initiatives targeted at specific lifestyle and behavioral risks of NU's population produced their intended results?

Results

Analysis of WellAware's impact examined the actual annual per capita health benefits costs of NU's population during the years 1992 through 1996. This analysis allowed for factors that influence health care cost outcomes such as the aging of the population, plan participant's migration from fee-for-service to managed care, improvements in managed care savings efficiency, increases in health care costs, and reductions in health risks related to changes in lifestyle.

The analysis found that during a time when most employers were experiencing per capita health care cost increases of 15-20%, NU experienced flat per capita costs. Of the total savings, NU experienced a \$1,400,000 reduction in lifestyle and behavioral claims. This reduction in lifestyle and behavioral claims was derived in the following way:

- In 1992, a claims analysis showed that about \$5 million in claims could be classified as potentially preventable. If these claims increased at average rates for employers, (between 3.5% and 4.5% per year), they would have reached \$5.75 million by 1996.
- In actuality, NU's 1996 potentially preventable claims were analyzed at \$4.35 million for the same population analyzed in 1992. Savings can be categorized as follows:

Actual reduction in claims	\$650,000
Foregone claims	\$750,000

Total savings reduction \$1,400,000

If, conservatively, 70% of the aggregate reduction in preventable lifestyle and behavioral claims is attributed to the positive effects of WellAware, net program savings for 1996 are:

Gross health care claims savings	\$650,000
Less expenses	\$639,000
WellAware savings	\$361,000
ROI	1.6

Future expectations for WellAware's impact on reducing claims grows greater with time. Broadening participation in programs, the lag between the change in unhealthy behaviors and a reduction in health care claims for many preventable conditions, high cost claimant opportunities, (the "20/80" phenomenon), and the results of this financial analysis provide a strong basis for these expectations.

B. Reduced Health Risks

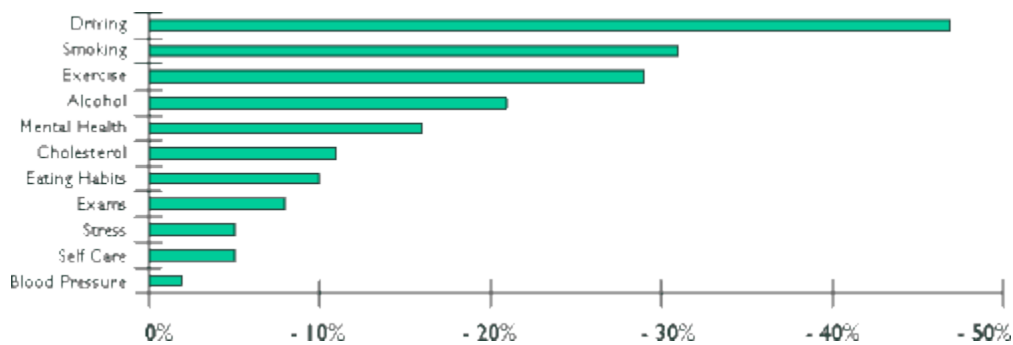
StayWell's HealthPath Health Risk Assessment (HRA) provides an assessment of important health risks that participants can reduce through changes in lifestyle habits. The StayWell HRA has gone through rigorous validation field-testing for more than 20 years.¹

The HRA is the first step to participating in the WellAware incentive program. Along with responding to more than 70 questions on various lifestyle habits, participants are required to include recent blood pressure and cholesterol measures for their HRA to be processed. During the period from 1998 - 2000, 4,125 individuals participated in the HRA. Based on their modifiable health risks, StayWell estimates that these participants generate \$8,878,200 annually in avoidable direct and indirect costs. The association between health risks and increased direct medical costs has been demonstrated by Goetzel, et al. ³

Changes in Health Risks

2,577 participants completed a second HRA between 1998 - 2000. These participant's average lifestyle score improved to 73 compared to 70 at baseline. Individuals completing a second HRA also experienced significant reductions in risks, including:

- 31% decrease in smoking
- 29% decrease in lack of exercise
- 16% decrease in mental health risk
- 11% decrease in cholesterol risk
- 10% improvement in eating habits
- 5% decrease in stress



Goetzel, et al also found that individuals with multiple risk factors for heart disease, stroke and psychosocial problems, incurred much higher average annual medical expenditures than did those individuals with fewer health risks. 3 In addition to the improved risk status and lifestyle scores, the number of health risks in the 2,577 repeat HRA participants improved. Participants with:

- less than three risk factors increased 6%
- less than two risk factors increased 9%
- six or more risk factors decreased 4%

These changes indicate improvement in overall health risk status. StayWell's Impact Model (SIM)¹ estimates an annual savings to NU of \$1,087,900 based on the risk reduction of these 2,577 participants.

HRA Plus Wellness Activity

Completing an HRA alone has been demonstrated to reduce health care costs, however findings also show that additional savings are realized when individual's completed an HRA *and* participate in a wellness activity.² Successful completion of the WellAware incentive program involves three steps: completing an HRA, participating in at least one health education activity and completing at least 12 consecutive weeks of cardiovascular activity. The following aggregate data compares the changes in risk levels for two groups of individuals who completed at least two HRA's. Individuals who completed the three step incentive program, (HRA + Health Education + Fitness) demonstrated a greater reduction in their level of risk for all health areas, compared to those participants who completed an HRA only.

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Risks	Complete 3 steps n = 1,700	Complete HRA only n = 1,133
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Blood Pressure

Low	+ 2.0 %	N/C*
Moderate	- 1.0 %	N/C
High	- 1.0 %	N/C

Cholesterol

Low	+ 5.5 %	N/C
Moderate	- 5.0 %	- 3.0 %
High	- 0.5 %	+ 3.0 %

Eating Habits

Low	+ 6.0 %	+ 1.3 %
Moderate	- 2.5 %	- 0.7 %
High	- 3.5 %	- 2.0 %

Exercise

Low	+ 15 %	+ 10 %
Moderate	- 5.0 %	- 2.5 %
High	- 10 %	- 7.5 %

Smoking

Low	+ 3.0 %	+ 2.5 %
Moderate	- 1.0 %	- 2.0 %
High	- 1.0 %	- 0.5 %

Stress

Low	+ 5.0 %	+ 1.0 %
Moderate	- 3.5 %	- 0.5 %
High	- 1.5 %	- 0.5 %

*N/C = No change

Targeted Intervention Outcomes

Participants whose HRA results demonstrate that they were at high risk in two or more health areas, were invited to participate in a telephone-based intervention program. The long-term impacts of this intervention model were evaluated in a study by Gold, et al,⁴ looking at pre and post comparisons between participants and non-participants. The study found that participants in a phone based intervention program were 1)

more likely to reduce their risks than were non-participants, and 2) more likely to reduce their risks in other areas *not* specifically targeted by the intervention.

The following data summarizes the changes in risks for two groups of individuals who completed at least two HRA's and were eligible to participate in a high risk telephone based intervention program. Results demonstrate that individuals who chose to participate in the phone-based intervention reduced their risk status while those who choose not to participate, demonstrated higher risk levels in all health areas.

Risks	Participants n = 143	Non-participants n = 110
Blood Pressure		
Low	+ 11 %	- 18 %
Moderate	- 13 %	+ 16 %
High	+ 2.0 %	+ 2.0 %
Cholesterol		
Low	+ 12 %	- 15 %
Moderate	- 10 %	+ 13 %
High	- 2.0 %	+ 2.0 %
Eating Habits		
Low	+ 1.5 %	- 2.8 %
Moderate	+ 2.0 %	- 2.8 %
High	- 3.5 %	N/C*
Exercise		
Low	+ 25 %	- 6.0 %
Moderate	N/C	+ 16 %
High	- 25 %	+ 10 %
Smoking		
Low	+ 13 %	- 4.0 %
Moderate	- 7.0 %	+ 6.0 %
High	- 6.0 %	- 2.0 %
Stress		
Low	+ 6.0 %	- 16 %
Moderate	- 7.0 %	+ 11 %

High

- 1.0 %

+ 5.0 %

*N/C = No change

D. Cost Savings For individuals With Heart Disease

A review of Northeast Utilities 1996 health care claims showed that coronary artery disease accounted for a total of \$1,377,000 in claims expenditure and an average per claim cost of \$5,400. This review also found that there were 57 CAD-related hospitalizations that year. Disability plus related inpatient and outpatient costs averaged \$46,582 per hospitalization.

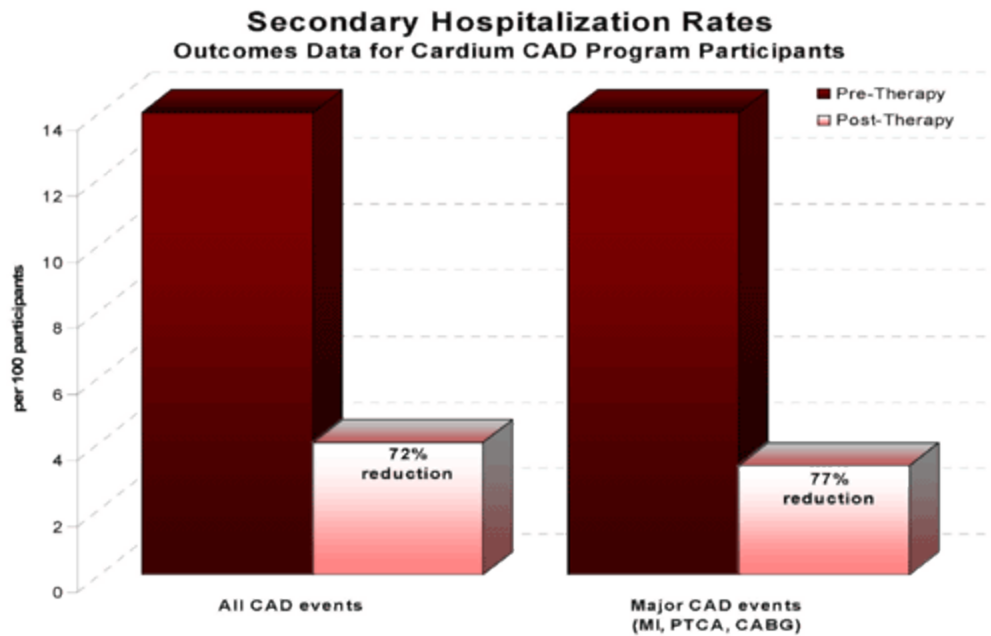
Research demonstrates that chronic diseases can be effectively managed by scheduled telephone calls as a substitute for clinical visits; leading to improved clinical results and significant economic impact.^{5,6} In addition, providing low-cost educational materials to individuals with disease, has been shown to improve their clinical outcomes and enhance self-management skills.⁷

A no-cost, telephonic secondary CAD pilot program was implemented for one year, with fifteen employees and spouses voluntarily participating. The goal of the intervention was to improve the quality of life for those with CAD and to reduce their incidence of re-hospitalizations, thereby reducing health care and disability costs. Key components of the program were bi-monthly telephone counseling sessions with a health professional and educational support materials.

During the one year pilot, participants experienced zero re-hospitalizations and shared extremely positive participant satisfaction feedback. Based on the results of the pilot group, the CAD intervention was offered to all employees, spouses and early retirees who were diagnosed with heart disease. The following aggregate data documents outcomes for 183 participants with an average participation in the CAD program of 10 months.

Re-Hospitalization Rates

Cardium's CAD management program has reduced the prevalence of repeat hospitalizations among the NU participant population. In the year prior to program implementation, approximately 12% of individuals in NU's covered population were hospitalized for heart disease. After participating in the intervention, only 2.2% were hospitalized. This corresponds to a 72% reduction in all CAD events and a 77% reduction in major CAD events, such as heart attacks, open heart surgery, etc.



Clinical Interventions Outcomes

Aggregate changes in participant's baseline and current compliance scores are summarized below.

Medication Compliance: based on percentage of pills properly taken. Scale: 0-100

- Baseline compliance: 65
- Current compliance: 100

Total Cholesterol / LDL / HDL

- Baseline test: 173 / 102 / 40
- Current test: 165 / 101 / 45

Cardiovascular Exercise: weekly frequency (x) average workout duration (minutes).

- Baseline score: 103
- Current score: 136

Heart Healthy Diet: Food score is taken from food survey. Scale = 0-100

- Food survey results demonstrate a 50% improvement in participants modifying their diet.

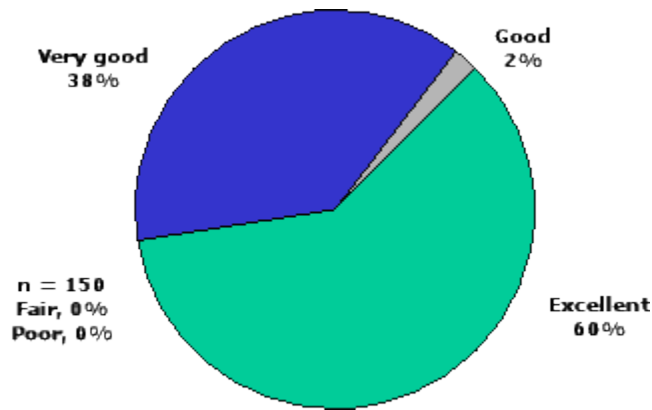
Smoking Cessation and Relapse Prevention.

- See results of the smoking cessation program within the pages that follow.

Participant Satisfaction Data

At six months of participation, a modified VSQ-9 questionnaire is used to determine each participant's level of satisfaction with the CAD intervention. Parameters such as technical skills of the counselors, quality of

educational materials, convenience and overall satisfaction with the program were queried. Results to date demonstrate that participants are extremely satisfied with the quality and content of the CAD program.



Return on Investment

The reduction in the rate of repeat hospitalizations from 12% to 2.2% corresponds to a reduction of 9.7 events over 100 patient years. A patient year is the equivalent of a twelve month period of program participation by a single individual. It may consist of one participant enrolled for 12 months, two individuals enrolled for 6 months, or any similar combination. Adjusting for the true number of 90 patient years measured, shows that the program averted 8.73 hospitalizations.

A review of NU's medical claims data indicated that the costs associated with a single hospitalization are, on average, \$46,582. Thus, the gross savings associated with averting 8.73 hospitalizations are approximately \$400,000. Net savings (gross savings minus program fees) are then approximately \$250,000.

$$\begin{aligned}
 \text{Gross Savings} &= \text{Reduced re-hospitalization rate (events/100 patient years)} * \text{Time (patient/years)} * \text{Cost (\$/event)} \\
 &= \text{Pre-Therapy - Post-therapy rate (events/100 patient years)} * \text{Time (patient/years)} * \text{Cost (\$/event)} \\
 &= \frac{11.9 - 2.2 \text{ Events}}{100 \text{ patient years}} * \text{Time (patient/years)} * \text{Cost (\$/event)} \\
 &= \frac{9.7 \text{ Events}}{100} * 90 * \$46,582^1
 \end{aligned}$$

$$\begin{aligned}
 &= \$406,661 \\
 \text{Net Savings} &= \text{Gross Savings} - \text{Program Fee} \\
 &= \$406,661 - \$156,000 \\
 &= \$250,661 \\
 \text{ROI} &= \text{Gross Savings} / \text{Program Fee} \\
 &= \$406,661 / \$156,000 \\
 &= 2.6
 \end{aligned}$$

1 Eligible inpatient amount per hospitalization = \$20,618 Eligible outpatient amount per hospitalization = \$1,000 Disability amount per hospitalization = \$24,964 (Work Loss Data Institute⁸)

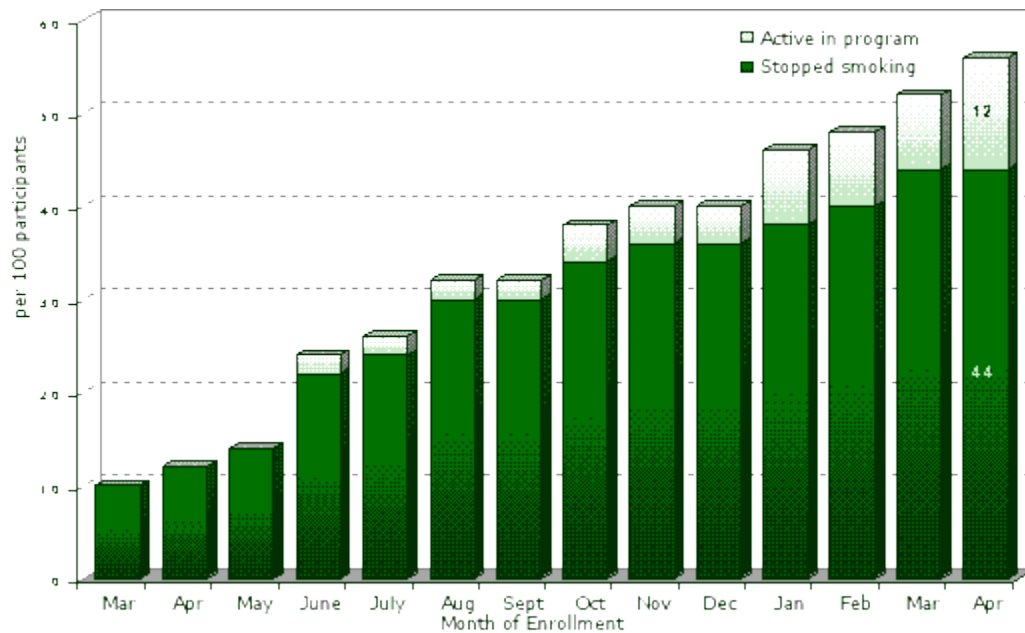
E. Smoking Cessation And Relapse Prevention

The majority of costs associated with employees who smoke are due to medical expenses.⁹ However, employees who smoke are also responsible for other smoking-related costs. Findings of a 1992 study on occupational risks among smokers versus nonsmokers, suggest smoking is associated with higher rates of absenteeism, injuries and other job-related problems.¹⁰ In addition, research findings show that smoking breaks are responsible for worker's lost time and productivity equivalent to 1% of their annual salary.¹¹ Although there are many factors and variables that need to be considered when determining the cost to employers, of employees who smoke, the most frequently cited estimate for the excess cost (1991 dollars) is \$1,300 per year per smoking employee.¹²

The WellAware program designed a smoking cessation intervention based on expert's recommendations that combining behavior modification with drug therapy is the most successful approach to helping people quit. No cost, telephonic one-on-one counseling provides participant's with convenient access to behavioral support. A \$100 rebate is also provided to reimburse participants for the costs of approved smoking cessation aids, (Nicotine Patch, Nicotine Inhaler, Zyban, etc.), which combat Nicotine addiction and are currently not covered by NU's prescription drug plan.

The 12 month results of combining nicotine-replacement therapy with one-on-one counseling has delivered a 44 percent quit rate, with another 12 percent of participants still actively enrolled in the program and

planning to quit. These results exceed national statistics which show that other smoking cessation programs typically result in 20 to 30 percent of patients remaining tobacco-free for six months.¹³



References

Reliability and Validity of StayWell's HealthPath Health Risk Assessment

The validity and reliability of StayWell's HRA technology has been developed and tested over a 20 year period and has been subjected to rigorous validation testing.

Content validity has been assured through a two-step process. Subject matter experts were consulted to identify and prioritize content domains to be included, to identify standard and often previously validated measurement protocols and develop initial questions for testing as necessary. Second, large groups of test participants were asked to complete and evaluate the questionnaire. Subsequent use of the assessment tools by several million participants had provided further verification of exceptional content validity.

Predictive validity of the assessment tools on key indicators such as mortality, medical costs and absenteeism has been validated by several landmark studies. StayWell's 1987 study linking health risk assessment questions to medical costs, "Health Risks and Behavior: The Impact on Medical Costs," conducted jointly with the actuarial firm of Milliman and Robertson, Inc., has been acclaimed as a milestone in the health promotion field. A 1995 study conducted by the same parties, replicated these earlier results.

The American Institutes of Research, Cambridge Research Center, validated mortality predications made by 40 HRA's against cases selected from the Framingham Study that has know mortality out comes. The validity of the StayWell HRA, was comparable to the best health risk assessments available in the study.

Reliability of the HRA was reviewed concordance between baseline and follow-up risk levels across both self-reported and screening risk measures. For 2 week intervals of test-retest reliability assessment, concordance levels generally approached 100% for most assessed risk areas.

StayWell Impact Model

The StayWell Impact Model (SIM) is a proprietary analysis tool that estimates avoidable health care costs based on demographic and health risk data collected by the HRA. SIM projects current avoid able costs related to current participant health risks. The health risks represent significant avoid able health care costs and include, smoking, lack of exercise, weight control, back care, driving, blood pressure, cholesterol, mental health, stress, and alcohol use.

SIM was developed based primarily on the results of a series of studies, the first of which was a landmark study: Health Risks and Behavior: The Impact on Medical Costs, 1987. The most recent research supporting SIM is the HERO study, conducted by StayWell and the MEDSTAT Group and sponsored by the Health Enhancement Research Organization.