

# Playing the Game of Health: Best Practices for Health Optimization Program in a Worksite Setting, with Case Study of a Real World Example

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## **Abstract**

*While there have been multiple efforts to improve the health of the population, and simultaneously reducing the cost of healthcare and improving the quality of care, there is no single model for improving population health. Worksite health is a microcosm of the health of the nation and the results of been mixed. This paper considers the best practices associated with key worksite health. These best practices include the type of worksite intervention, attention to health literacy, engagement, onsite clinics, coaching and care plans, a digital platform, social support, population health, performance excellence, performance improvement, and an evaluation strategy. While each best practice is considered important, very few programs provide all of the components, and most emphasize one component over the other. A gap in the literature, therefore, is how these best practices can be combined into a single program. Following the review of literature of best practices, a case study, of the program design, of a comprehensive worksite program was conducted to demonstrate how these best practices are operationalized. The Game of Health, is a cognitive based program that focuses on stress management and behavior change in a program that provides onsite programs, a medical clinic, and a digital platform.*

## **Keywords**

*comprehensive lifestyle intervention, stress management, cognitive health, prevention, digital platform, health literacy, population health, social support*

## 1. Introduction

With a continued emphasis on achieving the triple aim of improving health, lowering cost, and improving the quality of the healthcare system many organizations are still in search for an effective worksite model (Stiefel et al., 2012). While many strategies implemented in the worksite setting have focused on the supply of healthcare services, including benefit design and improving access to care, there continues to be a largely untapped opportunity to reduce the overall demand for healthcare by preventing high volume and expensive health conditions. Popular worksite strategies include onsite medical clinics, onsite fitness facilities, wellness and disease management programs. The most effective mix of these programs, however, remains elusive. The proliferation of digital tools, such as health-related apps, connected health devices, social networks, and web-based programs offers additional opportunities for improving the scalability and sustainability of these programs, by providing access to programs outside of the worksite and healthcare setting, but also adds to the uncertainty of which programs to provide. It is important, therefore, to base the design of worksite programs on existing science and evidence based practices. The purpose of this article is to identify best practices in promoting worksite health, using a cognitive, stress management approach to health optimization, and to describe a worksite program designed to optimize health of a worksite population, based on the current science and evidence. This article has two parts. The first part is an overview of best practices for achieving health optimization in a worksite setting. The second part is a case study of the design of a cognitive, lifestyle intervention program.

### 1.1 Background

The Game of Health (GOH) is a lifestyle modification program that has been implemented in both a medical and a worksite setting (Courtney, Conard, Dunn, & Scarborough, 2011). Educational and treatment principles are based on evidence based guidelines for cholesterol, blood pressure, glucose, and weight management, utilizing evidence based guidelines for physical activity, nutrition, and stress management. The GOH provides a cognitive approach to health optimization by teaching lifestyle skills (Seven Healers, Conard, 2011), designed to improve health metrics (Seven Numbers, Conard, 2011). A cognitive approach using stress management as the primary intervention is used to help participants align their health goals with their lifestyle and behaviors. Physical and emotional distress is managed using a cognitive behavior change utilizing a psychographic approach (Koltko-Rivera, 2004). The GOH is provided through an onsite medical clinic, onsite group educational session, and a digital platform.

## 2. Method—Literature Review of Best Practices in Worksite Health

### 2.1 Comprehensive Lifestyle Intervention

Successful worksite based stress management programs must be constantly evaluated and updated to meet the needs of the organization (Giba, Cooper, & Faragher, 2003). Numerous stress management interventions have been implemented in the worksite setting, including cognitive, relaxation,

organizational, and multimodal (Richardson & Rothstein, 2008). According to Richardson and Rothstein (2008) stress management programs that have employed a cognitive approach have achieved the best results.

While literature on the effectiveness of worksite wellness programs is mixed, there is consensus that healthy behaviors are directly linked to health outcomes. There are plenty of examples of worksite wellness programs that have developed and maintained healthy behaviors, resulting in better health and life satisfaction (Merrill, 2011). The debatable question, however, is which healthy behaviors to focus on. Smoking, diet and nutrition, and physical activity are the primary behaviors, while others may include the use of seat-belts, and self-assessments. Additionally, programs focused on stress management may include relaxation, deep breathing, or meditation, as well as sleep and sleep hygiene. The American Heart Association has identified 7 indicators of ideal health (Lloyd-Jones et al., 2010). These factors include a combination of biometric assessments, including blood pressure, cholesterol, glucose, and weight, and behavioral factors, including physical activity, nutrition, and tobacco use.

The American Heart Association Lifestyle guidelines (Eckel et al., 2013) recommend a cognitive approach to dietary and physical activity recommendations in the treatment of cholesterol and blood pressure. The American Heart Association Obesity guidelines (Jensen et al., 2013) recommend comprehensive lifestyle interventions in the management of obesity. In a randomized trial, a comprehensive lifestyle modification program resulted in improved physical fitness and better control of weight and blood pressure (Elmer et al., 2006). These “comprehensive” interventions, however, largely focus on diet and physical activity (Artinian et al., 2010). A comprehensive lifestyle program that included stress management resulted in significant benefits for regulation of blood pressure, as well as body weight and psychosocial well-being (Darviri et al., 2015).

Stress management has been shown to be effective in improving physiologic and biomarkers for cardiovascular disease and diabetes. Blumenthal et al. (2005) conducted a randomized controlled trial of exercise and stress management in patients with cardiovascular disease. Exercise and stress management were associated with lower levels of distress and improved ejection fraction (Blumenthal et al., n.d.). Surwit et al. (2002) found that stress management was found to be associated with improved glycemic control in patients with type 2 diabetes.

### *2.2 Health Literacy Progression*

A direct challenge to a cognitive approach to health optimization is the knowledge and health literacy of the person. There is an established causal connection between health literacy and health outcome (Paasche-Orlow & Wolf, 2007), and the mechanisms linking health literacy to health behaviors have been established (Osborn, Paasche-Orlow, Cooper Bailey, & Wolf, 2011). Health literacy skills progress from language to numeracy, to navigation, to communication, and finally to decision making (Dunn, Margaritis, & Anderson, 2017). For knowledge and skills to progress the first step is to address the emotional health of the patient, followed by a behavioral approach, and finally an instructional strategy (Dunn et al., n.d.).

### *2.3 Engagement*

The approach to health optimization can be as important as the content. There is a natural tension between being too prescriptive or allowing too many choices. Ultimately, organizations and individuals are much more likely to achieve their goals if an action plan, with measurable objectives, a timeline, and accountability system is in place (Burt et al., 2012). An often-overlooked element of a plan of care is the level of patient interaction, or engagement. Key elements of the engagement plan include making it as user/patient friendly as possible, and making the content interesting so that the patient continues to use the system. To make the care plan more interesting it needs to be highly personalized, relevant, interactive and social.

A new, and interesting approach to engagement, made possible with artificial intelligence systems is the ability to customize the behavioral approach. An overall assessment of the data on comprehensive lifestyle change using a cognitive approach reveals that a “one-size-fits-all” approach is not adequate to engage a diverse population, such as a worksite. While segmentation has been used effectively in marketing, it is relatively new in healthcare, and when it is done, is usually based on demographic factors, not personality types (Hardcastle & Hagger, 2016).

### *2.4 Coaching and Care Plans*

Care plans are tools used by healthcare providers and are a key component of a modern healthcare system (Hyde & Murphy, 2012). In fact, plans of care are a required element for Joint Commission accreditation (Schmaltz, Williams, Chassin, Loeb, & Wachter, 2011). These plans of care, however, are typically used exclusively by healthcare providers to ensure that evidence based practices are met and health outcomes are achieved. There is, however, a gap between the science and evidence based care and practice (Burt et al., 2012).

Cardiovascular and metabolic conditions including coronary artery disease, hypertension, heart failure, lipoprotein disorders, and diabetes are complex, demanding conditions requiring skill and knowledge on the part of the patient (Artinian et al., 2010). Compared to a condition that is simple to detect and simple to treat, the management of cardiovascular disease and diabetes requires a much higher level of patient involvement (Smith et al., 2013). Care plans, developed by healthcare providers, that are consumer/patient facing and focused are a method for helping the individual prioritize and filter the key information.

### *2.5 Digital Platform*

The use of digital tools and mobile technology, for example smartphones, tablets, and devices that can monitor biometric data including blood pressure, heart rate, and calories, has fundamentally changed how individuals with chronic health conditions find and use health information (Beatty, Fukoaka, & Whooley, 2013). An increasing number of patients are using web-based tools to find information on diseases, conditions, and treatments, and mobile devices to track their results and communicate with their healthcare team (Lefebvre & Bornkessel, 2013). Of the adults who live with a chronic health condition, 72% of them use the Internet (Fox & Duggan, 2013). People with chronic health conditions

use the Internet for many health-related activities such as gathering information about their medications, conducting research on alternative approaches, and reading about other people's experiences (Fox & Duggan, 2013). Using HIPAA compliant web services, the digital platform can access data from the electronic medical record, and be accessible to patients outside of the clinic and worksite, including their home.

### *2.6 Social Support*

With the advent of social media platforms, such as Facebook and Twitter, social support has emerged as a promising tool for wellness. Platforms such as Patients Like Me (Richards, Coulter, & Wicks, 2015) and the Patient Support Network (American Heart Association, 2014) have emerged as popular platforms for health-related social sites. Low-tech and non-tech options, such as group meetings, and company events, may be viable in a worksite setting, and have the potential to provide the same types of benefits, but may lack scalability. The connection between social support and health is because it reduced anxiety, provides an opportunity to share experiences, and, therefore, becomes another learning platform (Dunn, Margaritis, & Anderson, 2017).

### *2.7 Onsite Clinic*

In addition to addressing work-related injuries and illness, an onsite, or near site clinic offers that opportunity to address areas of physical and emotional distress. Physical signs and symptoms, such as elevated blood pressure, headaches, or back pain, can be identified and addressed. These signs of distress may be linked to impending acute and/or chronic illness, and provide an opportunity for prevention. Signs of emotional distress may include work-related stress, and may be manifested as depression or anxiety. The "virtual clinic" can be extended beyond the walls of the clinic and the worksite using telemedicine services. This can be especially beneficial to employers with remote workers and multiple locations (Chenoweth & Garrett, 2006).

### *2.8 Population Health Reporting*

In addition to providing health-related knowledge and skills to individuals in a worksite setting, population health management is a key component of achieving the triple aim (Buffalino et al., 2014). This information can be used to identify emerging trends, as well as gaps in care, which can be part of the overall health plan design. In addition to tracking process and outcome measures, computerized treatment and decision support protocols can be delivered directly to individuals and their healthcare team (Hyde & Murphy, 2012). In addition to segmenting patients by their personalities, they can also be segmented by their clinical/claims profile, identifying those individuals that are at greatest risk for an adverse health event.

### *2.9 Performance Excellence/Performance Improvement*

The Baldrige Criteria and Lean Six Sigma are used to achieve excellence and provide continuous quality improvement in both healthcare and worksite settings (Vest & Gamm, 2009). Using a systematic approach, gaps in performance can be identified more quickly allowing the process to be more agile and adaptive. Watkins et al. (2014) demonstrated the value of lean six sigma tools in the

assessment of behavioral health in the U.S. Army.

### 2.10 Evaluation

While systematic reviews and randomized trials are considered the highest level of evaluation methodology, there is a growing appreciation for more adaptive, designs, using both inductive and deductive methodologies (Curran, Bauer, Mittman, Pyne, & Stetler, 2012). These adaptive designs require a mixed methods approach, using multiple cycles of learning. Qualitative methods are used to gain deeper insights into hard to solve problems, which quantitative methods are used to test the effectiveness of the program. Qualitative methods are gaining acceptance, even in areas dominated by quantitative, hypothesis driven research, such as cardiovascular research (Krumholz, Bradley, & Curry, 2013). Qualitative, quantitative, and mixed methods research should be used to investigate complex phenomena that are difficult to measure providing a deeper understanding leading to better approaches, strategies, instrumentation, hypotheses, and outcomes (Curry, Nemhard, & Bradley, 2009).

Table 1 is a review of the best practices in worksite health, including some key references, as well as a description of how the Game of Health has applied these principles.

**Table 1. Best Practices for Worksite Health**

Component	References	Game of Health
Comprehensive lifestyle intervention	Lloyd-Jones et al., 2010	Seven Numbers, Seven Healers
Health literacy progression	Paasche-Orlow & Wolf, 2007	Seven Numbers, Seven Healers
Engagement	Beck and Cowan, 2014	Seven People
Digital platform	Beatty et al., 2013	Game of Health app; website
Coaching and care plans	Hyde et al., 2012	Seven Numbers, Seven Healers
Social support	Richards et al., 2015	Group office visit; GOH community
Onsite clinic	Chenowith, 2006	GOH Medical, Seven Signs
Population health	Buffalino et al., 2014	The TROUBLE Report, NME
Performance excellence	Vest et al., 2009	Lean Six Sigma
Evaluation	Krumholtz, 2013	Mixed methods

### 3. Results—Case Study of a Comprehensive Lifestyle Intervention Program

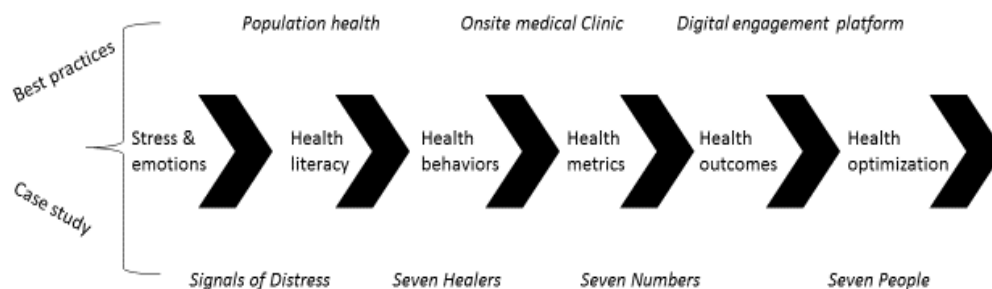
The Game of Health (GOH) is provided in a worksite setting that includes an onsite medical clinic and a digital platform. The GOH originated in a family practice setting, and due to its popularity among patient/participants, it grew into a worksite an online lifestyle change program (Courtney, Conard, Dunn, & Scarborough, 2011). The gaming format was used to make hard to understand concepts, such as hypertension, high cholesterol, and obesity, more interesting and provided a framework for

mastering lifestyle factors, such as nutrition, physical activity, and stress.

GOH Medical is an onsite clinic and is focused on prevention and acute, primary care. The Clinic is operated by a Medical Doctor, a Nurse Practitioner, and two medical assistants. Services include annual and biometric screenings, acute care, immunizations, EKG and in office lab tests at no charge. The focus on primary, secondary, and tertiary prevention to improve lifestyle, identify and reverse pre-disease, and to avoid complications of diagnosed disease, slows and/or reverses conditions (depending on the individual) to achieve the triple aim. This approach also has been found to reduce catastrophic events in asthma, coronary disease, heart failure, chronic obstructive disease, diabetes, chronic pain, primarily musculoskeletal in origin, and other chronic conditions. The clinic serves over 1,000 employees and the clinic sees an average of 20 patients per day.

In addition to the GOH Medical onsite clinic, the GOH provides a cognitive, lifestyle intervention program, focusing on stress management. The GOH is offered in a group office visit model, and through a digital platform. Cognitive stress management skills were selected because they have a significant impact on health behaviors, health metrics, health outcomes, and overall well-being, as shown in Figure 1. Eligibility for participating in the GOH is based on the Signals of Distress assessment, which includes both physical and emotional factors. Also, the participant must agree to be an active participant in the program and have access to email, smart phone, and the internet. Figure 1 is an illustration of how a cognitive approach, focused on stress management, can lead to health optimization. This line of sight starts with stress and emotions, which impact health literacy, behaviors, and key metrics, resulting in better outcomes, and finally health optimization.

## Model for health optimization: Link between cognitive lifestyle intervention and health optimization



**Figure 1. Model for Health Optimization**

A case study is being conducted at a worksite in Dallas, Texas. The case study will include no less than 30 and no more than 50 participants. To be eligible, employees must complete the Signals of Distress and Seven Healers assessment, and have current labwork to complete the Seven Numbers assessment.

Employees will be recruited from GOH Medical and must consent to participate in the case study. The case study will include a seven-week program that includes an onsite meeting, and access to the GOH app. The case study also will include an onboarding and exit visit. Follow up visits will be conducted at 6 months and one year, and will include an updated Seven Numbers, Seven Healers, and Signals of Distress assessment, as well as of review of the participant's healthcare utilization. A composite score of the Seven Numbers, Seven Healers, and Signals of Distress will be the primary endpoint.

### *3.1 Program Components*

The core components of the GOH are the Seven Healers, the Seven Numbers, the Seven Signs, and the Seven People. The number seven is used to help participants remember the key components, and is felt to be the maximal number of variables that the average person can capably assess and manage at any one time.

The Seven Healers are described in greater detail by Conard (2011a). The Seven Healers are the necessary ingredients of life, and are shown in Table 2. All seven healers are actionable and are tied to better health. For example, the body can only live for a few minutes without air, a few days, without water, and about a week without sleep. These factors are often forgotten as components of good health, but improving air quality, by deep breathing and avoiding smoking; improving water quality by consuming more water that is not contaminated with sugar, caffeine, or alcohol; and sleep quality by using good sleep hygiene, are available to all participants. General principles of physical activity and nutrition are reviewed and in the setting of a medical conditions such as high cholesterol, blood pressure, glucose, and weight additional key components are reviewed. Finally, the quality of relationships and insight into a participants purpose for changing are necessary for ongoing engagement necessary for continual improvement of health and well-being.

The Seven Numbers are described in greater detail by Conard (2011b). The Seven Numbers began as the TROUBLE report, which included training (exercise and physical activity), roundness (body composition), oil (cholesterol and triglycerides), unacceptable sugar (glucose), blood pressure, lousy habits (such as smoking), and exploding plaque (risk of heart disease or strokes). The TROUBLE report then expanded to the STOP TROUBLES report, adding shots (immunizations), tests (such as mammography and colonoscopy), oral medications, and physical examination to the front, and stress and emotions to the end.

The Seven Signs are common symptoms that individuals should be aware of and report to their healthcare team. The seven signs are shown in Table 2. The Signals of Distress is in the Seven Signs domain, and is used as a more comprehensive of physical and emotional distress, including work-related stress.

The Seven People are personality types that incorporate four psychographic personas (power, achiever, traditional, and pluralistic). These personality types are represented as characters that incorporate their issues with the Seven Healers and Seven Numbers.



**Table 2. Game of Health Content Areas**

<b>Seven Numbers</b>	<b>Seven Healers</b>	<b>Seven Signs</b>
Training	Air	Chest pain
Roundness	Water	Shortness of breath
Oil	Sleep	Dizziness
Unacceptable Sugar	Food	Swelling
Blood Pressure	Play	Headache
Lousy Habits	Relationships	Back and joint pain
Exploding Plaque	Purpose	Fatigue

The GOH begins with an onsite clinic visit. The initial visit includes an updated Seven Numbers, Seven Healers, and Signals of Distress assessment (Table 2). Group sessions are then conducted once a week for 7 weeks. The digital platform includes educational content, including a weekly podcast/blog, the Seven Signs and health literacy assessment, based on the weekly topic, a weekly challenge, and a social network.

### 3.2 Assessment

The assessment plan includes the type and timing of assessments, including biometric and subjective data is shown in Table 2. All assessments must be aligned with the core components, as well as goals and action plans. Data from the assessments are linked to the education and communication plan. The assessment schedule determines the frequency of each assessment category. Decision support tools are designed to support decision making on the part of the patient. The assessment plan also includes any pre-program assessments, including medical history, functional assessments, and risk assessments.

The Signals of Distress assessment is based on descriptions of physical and emotional distress. The Signals of Distress is correlated with the DASS 21. The Seven Healers and Seven Numbers are correlated with the American Heart Association's Life Simple Seven, which has many common elements. A general health literacy assessment is conducted in the first week of the program, with short subscales, based on the weekly topic, and is based on the s-TOFHLA (Baker et al., 1999).

NME (No More Excuses) is a reporting tool is a large database engine designed to help identify the needs of the organization from a population health perspective. The NME tool identifies at risk employees and identify the actions (gaps in care) needed to reduce risk. Disease specific battle plans for cardiovascular, metabolic, musculoskeletal, cancer, and other common conditions are implemented at the clinic level. The NME reports also assess the cost of healthcare interventions to changes in clinical risk. Using a combination of actuarial and clinical predictive modeling compared to previous health spend four quadrants are created to illustrate individuals that are low cost and low risk (healthy), low cost, but high risk (high potential for future costs), high cost, low risk (one-time episode, not likely to recur), and high cost, high risk (chronic) allowing better focus and allocation of available interventions and resources.

### 3.3 Engagement

The GOH engagement strategy includes the use of psychographics to align communications with different personality types of motivators, and a coaching model that is designed to build health literacy skills and make complicated concepts more interesting to participants, using both individual, group, and online formats. Four personality types, codes as colors red, blue, green, and orange were developed by Beck and Cowan (2014). Seven personas (the Seven People) have been built, featuring different combinations of personalities, the Seven Healers, and the Seven Numbers. These personality types reflect not only “who” and “where”, but also the “why” and the “how” individuals engage in the programs, resulting in better engagement in the program. In the early stages of the program, the participants are asked which persona they are most closely related to. Knowing this the program going forward utilizes the communication and coaching approaches based on the four psychographic domains (power, achiever, traditional, and pluralistic).

Individual and group level coaching is conducted through the GOH digital platform. This includes private and group level messaging. Video conferencing can also be conducted between the coach and the participant, or with clinic staff (physician or Nurse Practitioner) and the participant. Coaching is used to engage the individual, provide individualized care plans, and help the individual navigate the healthcare system. The care plans are personalized using a modular approach, so that content can be expanded or filtered based on the patient’s condition. For example, if the individual has high blood pressure and diabetes, both conditions can be addressed simultaneously through the care plan. The patient sets their own goals and action plan, including the core component, targeted metric, timeline and accountability. Likewise, the plans can be more relevant by giving the individual the ability to prioritize their goals and action plans. For example, an individual might wish to prioritize blood pressure control and physical activity. Patient centeredness and evidence/science based are reconciled using a shared decision making model by providing the patient with evidence based choices when selecting their goals and action plans.

Care plans are made interactive by providing two-way communication between the individual, care givers, healthcare professionals and other individuals. Also, educational content includes quizzes on knowledge, and surveys. Individuals are given a voice to share their preferences and experiences, and can even share their own data by becoming part of research studies. These preferences can provide even deeper insights into key issues, and from the perspective of the patient. Finally, the care plans can connect to social networks so that patients can interact with other patients. The social and emotional support provided through the care plans can reduce the level of anxiety of the patient, provide an opportunity for the patient to share experiences and learn from other patients, and can be an instructional platform.

The communication plan is designed to connect the patient and their healthcare team outside of the healthcare system. This communication is done through secure messaging and feedback to both the patient and the healthcare team on the progress of the patient. This feedback may come in the form of

alerts or follow up messages. Specific components of the communication plan include communication with and among healthcare professionals and care givers. This includes alerts and follow up messages to patient and healthcare professionals, two-way communication between the patient and the healthcare provider, and updates/dashboards for the patient and the healthcare provider.

Educational materials are in the form of videos, audio podcasts, blogs, print materials, and email. The educational materials are designed to be edu-taining, and are aligned with the disease specific battle plans. The materials follow a progression of health literacy skills, from language, to numbers, to navigation, to communication, and finally to decision making.

### *3.4 Evaluation*

The evaluation plan is designed to measure participant level progress, based on the Signals of Distress, Seven Healers, and Seven Numbers assessment. Individual progress will be available to the participant and their healthcare team in a secure manner. Aggregated, de-identified data will be used to determine the overall effectiveness of the program, based on pre-determined evaluation metrics. A performance excellence/performance improvement methodology, based on the Baldrige Criteria and Lean Six Sigma is used to achieve the highest level of performance. Data from each participant also will be a source of new discovery into the identification of best practices associated with clinical, operational, and population health metrics.

1. Quality of Care: Based on clinical practice guidelines (Buffalino et al., 2013). These will include any discharge measure, such as medications or clinical measures.
2. Clinical measures, specific to the care plan, which can be measured post discharge, such as blood pressure, weight, heart rate, glucose, lipids (Lloyd-Jones et al., 2010).
3. Self-management measures, including medication compliance, and adherence with key behaviors, including physical activity and nutrition (Eckel et al., 2013).
4. Engagement measures, common to all care plan, which will include the sessions completed (Courtney, Conard, Dunn, & Scarborough, 2011).
5. Outcome measures, such as readmissions, symptoms reported, or goals achieved (Stifel & Nolan, 2012).
6. Quality of Life measures, including perception of care and satisfaction (Richards, Coulter, & Wicks, 2015).

## **4. Discussion**

Part one of this paper provides an overview of the best practices associated with managing the health of a population in a worksite setting. It is clear from this overview that achieving population health, with higher quality and lower cost has many facets that must be identified and managed. No single component can achieve the Triple Aim in isolation. It is the composition of these elements that can lead to success or failure of an intervention. Part two of this paper, provides a case study of a comprehensive lifestyle intervention that incorporates these elements.

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