WELLRIGHT

An WellRight, Inc **White Paper**

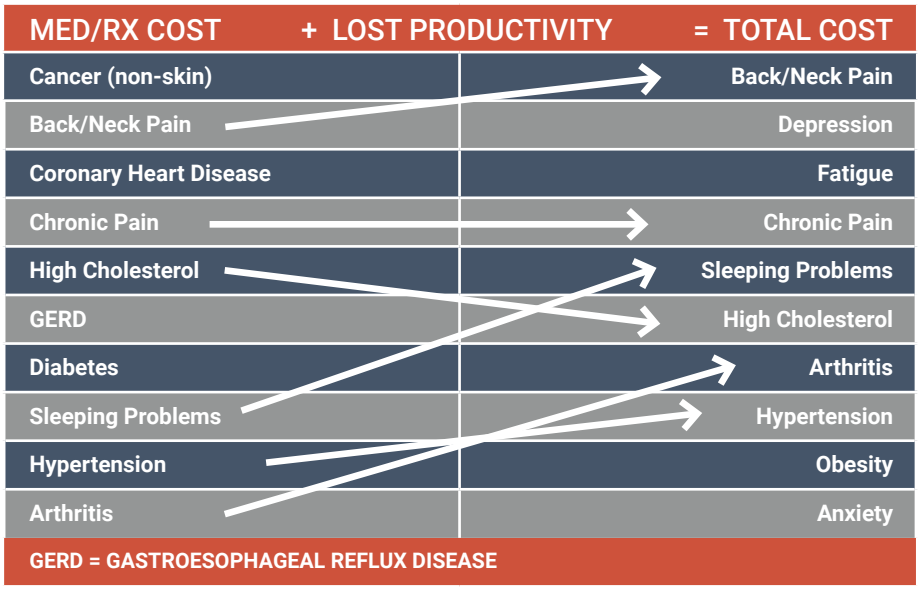
Understanding The WellRight Health Assessment

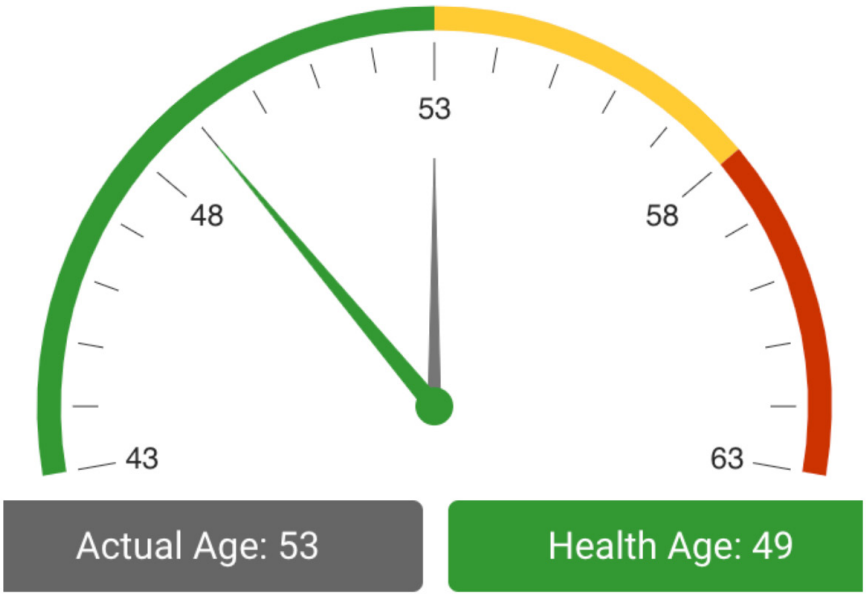
Health and Productivity in the Workplace:

An Evidence Based Approach

An aging workforce and growing evidence of the impact of health problems on productivity are leading to a shift in business priorities.[1] Rather than focusing on reduction of the actual dollars spent on health benefits, employers are beginning to embrace the concept of employee health as an investment to be managed. An evidence-based, scientific approach to workplace health has led to the development of a valuable tool designed to assess health risks so that employees can make life altering changes that will also benefit employers. It is important to realize that healthcare cost includes more than the financial burden of medical and pharmacologic treatment. Absenteeism and presenteeism also factor into the equation in terms of lost workplace productivity. The results of a health/productivity study conducted by Loeppke and colleagues provided valuable insights into health issues with the greatest impact on workplace productivity.[1,2] The cost of lost productivity was often found to be two to four times greater than the medical costs associated with most health conditions studied. It was also found that conditions such as back/neck pain, depression, and fatigue were more costly to the employer than previously recognized. As an example, while (non-skin) cancer is the most expensive condition to treat medically, back/neck pain actually impacts the workplace more because of lost productivity[2] (Table 1). Cancer is no longer listed in the top 10 when productivity cost is evaluated, several conditions are assigned a different rank, and four conditions that were not among the top 10 prior to inclusion of productivity cost moved to the top 10.

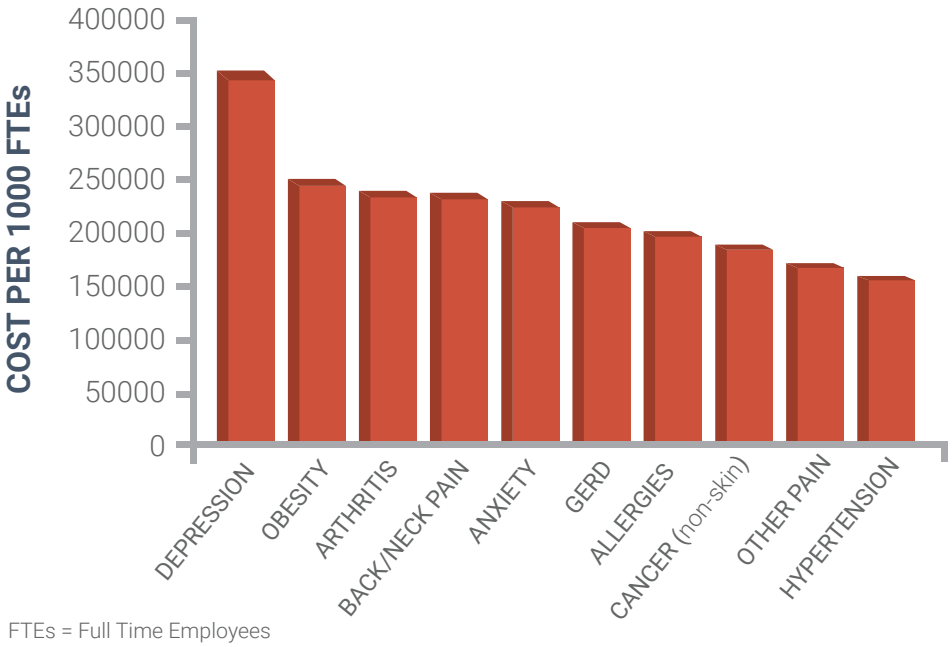
Table 1. Top 10 Health Conditions by Cost Category





Applying a modified version of their cost evaluation model to a larger sample of companies, the Loeppke group identified the 10 costliest health conditions in the US workplace as including obesity, hypertension, arthritis, and depression.[1] (Figure 1) Costs considered in this analysis were medical and pharmacologic treatment, absenteeism, and presenteeism. Improvement of health-related productivity begins with assessment of the issues facing your employees.

Figure 1. Costliest Health Conditions in the US Workplace.



FTEs = Full Time Employees

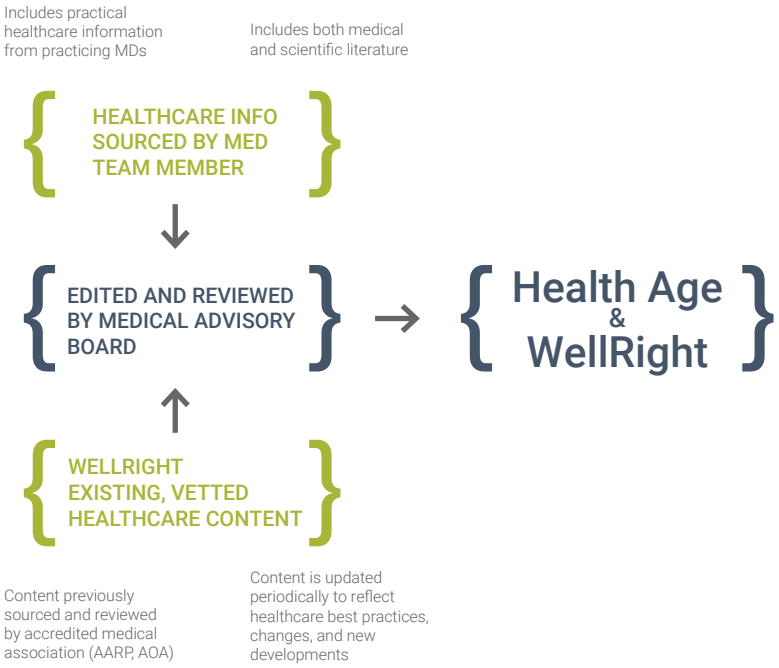
Improvement of health-related productivity begins with assessment of the issues facing your employees.

Quantifying The Risks

The HRA is a unique health risk assessment tool developed by WellRight, LLC, designed to assess users for 17 health conditions that are prevalent in the workplace. The selection of these particular conditions is reflective of our focus on prevalence as well as associated cost. This document provides an overview of the HRA, including the methodology behind the science used in developing this health risk assessment.

The schematic in Figure 2 summarizes the flow of research and data into the development of the HRA and our other health and wellness products. Healthcare information sourced by our medical team includes medical literature and real world clinical information from practicing physicians. It also includes resources from credible, respected organizations such as the American Osteopathic Association.

Figure 2. Scientific Flow of Health Age and Related Tools.



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After researching and determining the conditions and risk factors to be included in this assessment tool, we set out to understand the most accurate and direct methodology for assessing individuals' risks for these conditions. It was imperative to determine the associated factors that indicated level of risk for each condition. We began this process by accumulating the medical team's collective practical medical knowledge. Our team comprises specialists in internal medicine, emergency medicine, fitness training, nutrition, healthcare management, and biostatistics. Their practical knowledge was augmented by reviews of scientific literature regarding the various conditions and related risk factors. Source literature was obtained primarily from peer-reviewed medical journals from the MEDLINE® biomedical literature database of the US National Library of Medicine.

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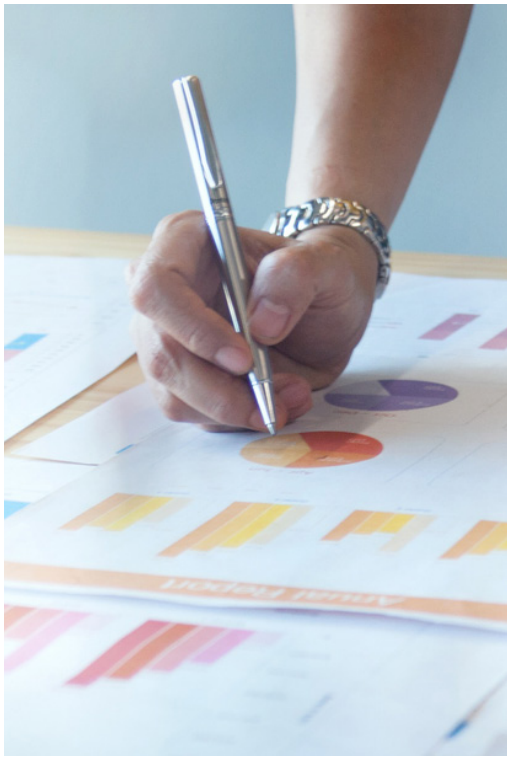
As an example of a source derived from practical knowledge and scientific material, the screening criteria for alcoholism were derived from the CAGE and AUDIT tests, both of which have been validated as simple alcoholism screening tools.[3,4] Other vetted sources of scientific information include:



- DSM IV for Mental Health disorders – based questions on predominant symptoms associated with the relevant conditions assessed[5]
- Asthma Research Source[6]
- Centers for Disease Control and Prevention
- National Institutes of Health
- Centers for Medicare & Medicaid Services
- American Journal of Health Promotion
- Journal of Occupational and Environmental Medicine
- American Journal of Managed Care
- New England Journal of Medicine

Cost-of-care data for each condition were derived from published research as well as multi-scaled population studies. For example, in researching cost-of-care for stroke, we cross-referenced reputable data with a study examining cost-of-care literature aggregated across the healthcare spectrum. The study added a level of refinement and an element of further accuracy to the value calculated specific to stroke.

Sources for cost-of-care data include:

- *American Heart Association*
- *American Diabetes Association*
- *New England Journal of Medicine*
- *Journal of the American Medical Association*
- *American Urological Association Education and Research*
- *American Cancer Society*
- *National Cancer Institute*

Health Risk Assessment Algorithms: The Power of Two

The HRA functions off of two very detailed algorithms that were built to assess the risk levels of participants based on their responses to assessment questions, which in turn, generate appropriate output and condition-specific material. One algorithm runs the assessments evaluation; the other generates the appropriate HRA score, which is the participant's "real" or physiological age.

The algorithm for risk factors is generated both from a general healthcare sense and from qualitative information related to the appropriate conditions to assess, based on potential cost impact to the employer. The quantitative information for the derivation of the mathematical algorithm was generated from reputable, evidence-based research studies. Because a number of sources were utilized for assessment of the various conditions, it was necessary to create a fairly complex algorithm that would assimilate the various data, and then create an appropriate score and "output" for each condition. The output had to sufficiently educate the participant and provide an accurate indication of their risk level for the different conditions being assessed. Figure 3 illustrates the multi-step process involved in creating the scoring aspect of the algorithm.

"Real" or physiological age may be different from an individual's chronological age, as it factors in lifestyle, demographics, and health conditions to determine the overall state of the body.

The age of the participant was factored into the equation through the HRA Score Variance algorithm (Figure 4) This algorithm is based on relevant, validated clinical research regarding level of risk relative to lifestyle habits, thus creating the logic for how one's physiological age is estimated.

Figure 3. Flow of Algorithm Scoring Process

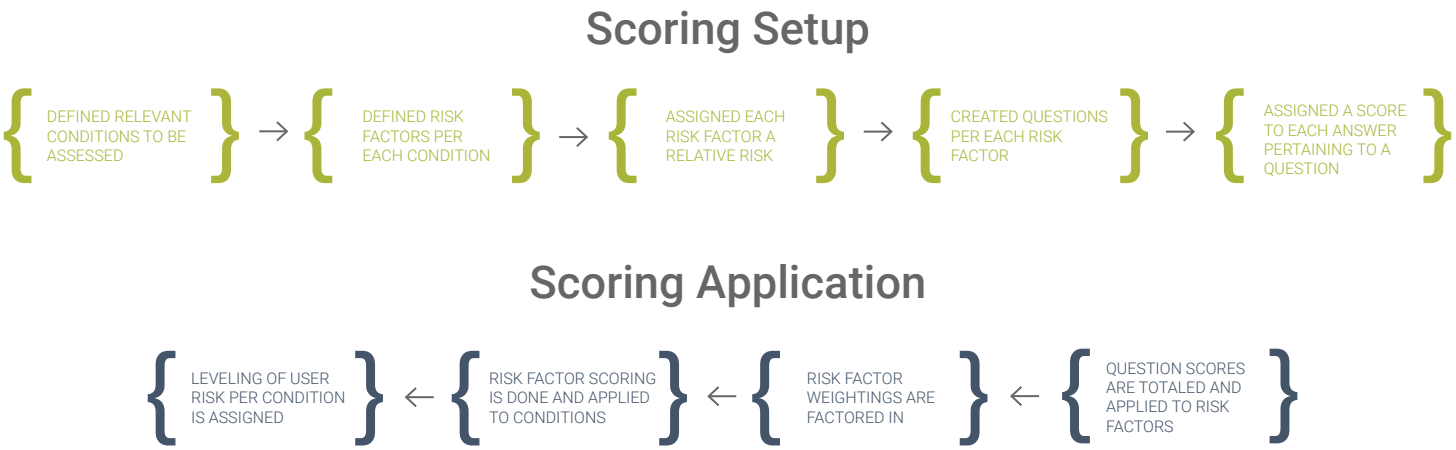
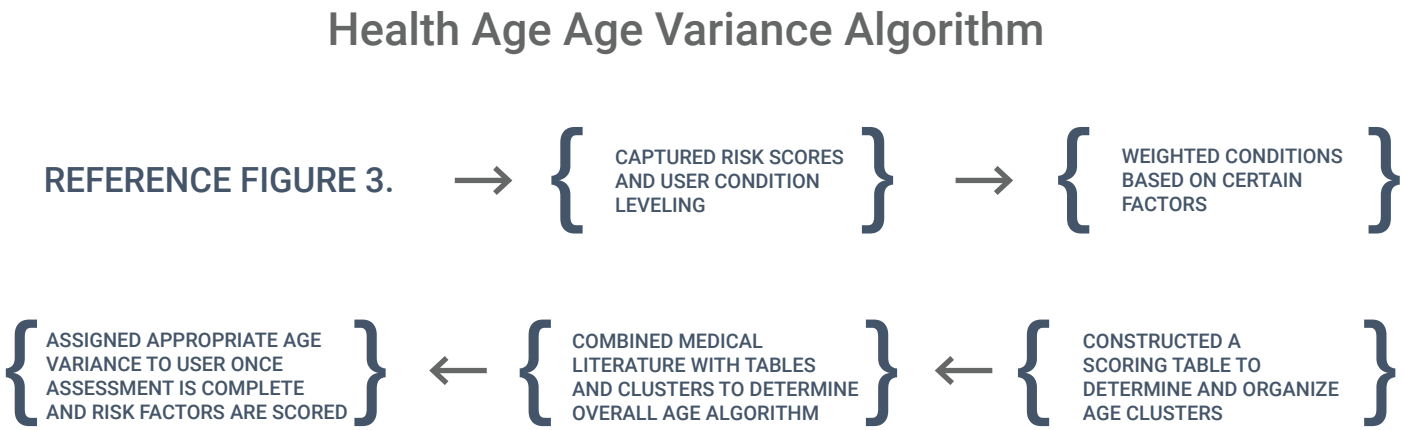


Figure 4. Health Age Score Variance Algorithm



What If...?

The What-If calculators are reverse-engineered, directional calculators that give the user an idea of what would happen “if” they were to reduce certain health risk factors. These calculators are meant to provide a practical, user-friendly indicator of the impact certain positive actions might make on the users’ overall risk levels. The approach taken with these calculators is to apply the algorithm used to determine the original HRA score and levels but to “reverse out” the appropriate terms associated with the different possible positive actions a user could take. Certain factors that are uncontrollable like gender, race, family history, and the like cannot be “reversed out” and therefore levels may not change. These calculators are meant to be directional for the user and provide an indication as to what they need to do in order to alter their risk for certain conditions.

Quality Assurance

In order to test both the application and the algorithm, members of the medical advisory board and quality assurance (QA) specialists were engaged to stress test the program through a series of hypothetical scenarios. Sample population testing and extreme conditions were applied to see how the program reacted. From this testing, design and usability modifications were made to ensure the highest level of program flow. In addition, refinements to the algorithms were made to ensure accuracy and proper reporting. Our medical advisors and QA specialists will continue to test the system as we move forward.

A Starting Point for Change

The HRA is a tool intended to identify and quantify health risks for individuals so they can make appropriate changes in their habits. Health management programs such as WellRight can be implemented in the workplace to help employees achieve these goals. Loeppke and colleagues found a strong association between employee health and productivity,[1] suggesting that better management of human capital would be a wise investment strategy.

Text Medical Advisory Board

The Text Medical Advisory Board is responsible for the vetting and revisions of all separately written text and articles that were created as part of the WellRight Health Solutions library. This board is the result of a partnership with the American Osteopathic Association called Doctor's Office Media. Chief Medical Officer, Dr. Gilbert E. D'Alonzo, Jr., D.O., who assembled a team of specialists to review the outlines of each article, then subsequently made revisions until a final draft was published.

Gilbert E. D'Alonzo, Jr, D.O.,
Chief Medical Officer

Member of the Medical Staff Executive Committee at Temple University Hospital, Past President of Temple University Hospital.

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Dan Schwab, Supervising Producer

Executive Producer at WellRight, previously worked as Executive Producer for major news outlets

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