

# A WORKSITE WELLNESS PROGRAM THAT IMPACTS DIABETES



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**What can an employer do to combat diabetes? There is hope. The study described in this publication illustrates the success of a wellness program that positively impacted the two main precursors to diabetes—obesity and Metabolic Syndrome.**

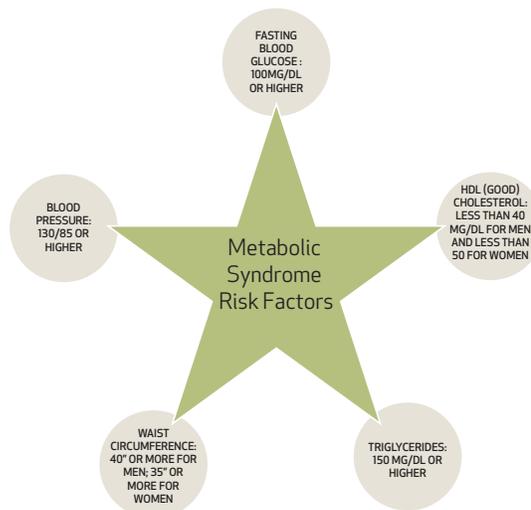
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## INTRODUCTION

It is common knowledge that there is an ever-increasing obesity epidemic in the US. Associated with this explosion of obesity is the increase in the incidence of diabetes. Obesity and diabetes go hand-in-hand. Reviewing trend since 1990 in the U.S., the rate of obesity has increased 127% (through 2008). The overall diagnosed diabetes rate has increased 115% (as of 1996).

The Centers for Disease Control and Prevention (CDC) estimated the annual cost of diabetes in the U.S. was \$174 billion in 2007. The CDC also estimates that the age- and gender-adjusted average medical expenditure for a person diagnosed with diabetes is 230% higher than for the same person without diabetes. According to statistics from UnitedHealthcare, the average yearly covered cost of an employee with diabetes is 1308% higher than the yearly covered cost for a healthy employee—\$22,512 compared to \$1,721, respectively. These figures do not include the indirect cost of diabetes, such as absenteeism and reduced, or lost, productivity.

Obesity is not the only predictor of diabetes. According to an article published in 2008 in *Diabetes Care*—the official journal of the American Diabetes Association, *Metabolic Syndrome* is a significant predictor of diabetes.<sup>1</sup> “Metabolic Syndrome” is a collection of risk factors that increases your chance of developing diabetes or heart disease or having a stroke and many other diseases and conditions. The picture below illustrates the five risk factors known as Metabolic Syndrome.



Of these risk factors collectively known as Metabolic Syndrome, fasting glucose is thought to be the strongest predictor of diabetes risk. Diabetes is a condition of excess glucose in the blood. The hormone insulin, secreted by the pancreas, is required to remove the glucose from the circulating blood and transport it into the cells of the body where it is required for energy and normal cell function. Persons with diabetes either cannot make enough insulin or cannot use the insulin that they make.

Previous studies have found that persons with Metabolic Syndrome have a four times greater risk of developing type 2 (non-insulin dependent) diabetes. The article, “Metabolic Syndrome as a Precursor of Cardiovascular Disease and Type 2 Diabetes Mellitus,” published in *Circulation*—the official journal of the American Heart Association, states that Metabolic Syndrome is associated with an increased risk for type 2 diabetes and cardiovascular disease for both men and women, accounting for approximately half of the new type 2 diabetes.<sup>2</sup>

## STUDY DESIGN

Biometric screenings for the five risk factors for Metabolic Syndrome were conducted before and after a ten-week wellness program for 3,612 adult employee participants from 37 different companies across the US. Some companies included participants who were spouses/domestic partners of the employees. Both type and size of the employers' industries were diverse. Employers included universities and school districts, energy and technology companies, municipalities, hospital systems and insurance carriers, transportation and retail industries, and others.

Of the 3,612 participants, 2,018 participants, or 55%, had Metabolic Syndrome, or at least three of the five risk factors. The wellness program was a behavioral-based Metabolic Syndrome program targeting eating behavior and weight loss.

Participants were divided into the following cohorts based on the results of the *pre-program* biometric screenings:

- Pre-diabetes fasting glucose, or "impaired fasting glucose"
- Pre-diabetes fasting glucose and Metabolic Syndrome
- Diabetes fasting glucose
- Diabetes fasting glucose and Metabolic Syndrome

Participants with a fasting glucose in the pre-diabetes range are at relatively high risk for the development of diabetes as well as cardiovascular disease. The American Diabetes Association states that nutritional therapy resulting in a 5-10% loss of body weight can prevent or delay development of diabetes for individuals with pre-diabetes, with the potential to impact the development of cardiovascular disease as well.<sup>3</sup>

There were a total of 1,457 participants who began the wellness program with a fasting glucose of 100 or higher. A fasting glucose of 100-125 is considered pre-diabetes. A total of 1,149 participants began the wellness program with a pre-diabetes glucose. A fasting glucose of 126 or higher is in the diabetes range. Out of the 1,457 participants, 308 began the program with a fasting glucose in the diabetes range.



## RESULTS

The table below illustrates the successful results of the wellness program for both the Pre-Diabetes and the Diabetes groups:

Measure	Pre-Diabetes (fasting glucose 100-125)	Diabetes (fasting glucose 126 or higher)
Count at Beginning	1149	308
% Improved Fasting Glucose	79%	82%
% Improved to Normal	51%	17%
% Improved to less than 126	N/A	51%
% with MetS Pre	83%	88%
% with MetS Post	46%	71%
Average Weight Pre	219.46	228.03
Average Weight Post	207.83	217.49
Average Weight Loss	11.63	10.54
Average Weight Loss (%)	5.3%	4.6%

### Fasting Glucose Levels Improved After Ten Weeks

For the 3,612 participants, the ten-week wellness program resulted not only in significant weight loss and reduction of Metabolic Syndrome and its risk factors, but also in significant improvement of diabetes and risk for diabetes.

- The number of persons with a normal glucose increased.
- The number of persons with pre-diabetes glucose levels decreased.
- The number of persons with diabetes glucose levels decreased.

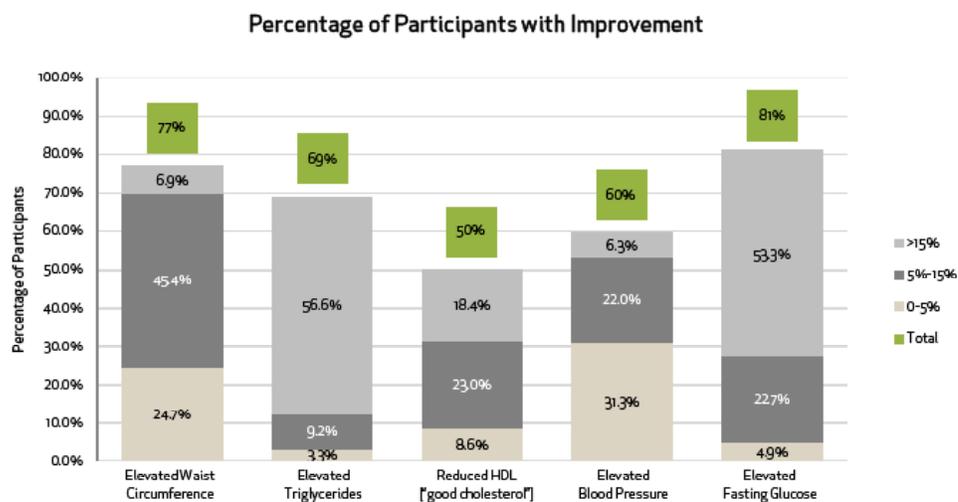
## Participants with Pre-diabetes and Diabetes Fasting Glucose Levels Reversed Metabolic Syndrome and Its Risk Factors

Out of 1,149 participants who started the program with a pre-diabetes fasting glucose, 948 had Metabolic Syndrome. Only 53% of these participants who started with Metabolic Syndrome still had Metabolic Syndrome at the post-program screenings.

The percentage of all pre-diabetes participants who had each of the five risk factors for Metabolic Syndrome was reduced at the end of the program. Most significantly, the greatest impact of the program was on fasting glucose, reducing the number with pre-diabetes glucose levels by 51%. For the pre-diabetes group with Metabolic Syndrome, the reduction to a normal fasting glucose was also 51%.

Out of the 308 participants who began the program with a fasting glucose in the diabetes range, 271 had Metabolic Syndrome. The incidence of Metabolic Syndrome for this group was reduced by 24% at the post-program screenings after the ten-week program. This is a significant improvement and it illustrates the importance of providing an intervention prior to the onset of a chronic disease or condition.

The percentage of all 308 participants with glucose in the diabetes range who had each of the five risk factors for Metabolic Syndrome, was reduced at the end of the program. *Overall, 81% realized an improvement in their glucose level.* More than half improved their glucose by greater than 15% and 17% reduced their glucose to normal. The percentage who improved each of the five risk factors was well above half with the exception of improvement of HDL ("good" cholesterol), which was at 50%. The table below illustrates the dramatic improvement for the 308 participants who began the program with glucose in the diabetes range.



## CONCLUSIONS

- A ten-week Metabolic Syndrome wellness program reduced risk for developing diabetes and other diseases and conditions by reducing Metabolic Syndrome and its risk factors, including fasting glucose.
- The wellness program reduced risk for disease for persons entering the program with pre-diabetes and diabetes glucose levels.
- Significant weight loss was achieved, which not only impacts diabetes, but also medical claims, workers comp and lost time costs.

## REFERENCES

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## ABOUT THE AUTHOR

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Janice Bartos supports wellness engagements and manages wellness-related projects for Trajectory Health, LLC. Since the first day of her professional nursing career more than 30 years ago, Bartos has been working with persons with heart disease and diabetes to help them reduce their risk factors for these diseases—a role that she continues in her current position as clinical consultant.

Prior to joining Trajectory Health, LLC, she had worked as a critical care nurse, nursing supervisor, staff development instructor, nursing instructor and consumer educator. In addition, Bartos was a Clinical Research Coordinator at University Hospitals Case Medical Center in Cleveland, Ohio, before relocating to Dallas, Texas in November 2007. Her prior experience has allowed her to excel at the evaluation and implementation of various clinical programs such as diabetes, smoking cessation, cardiovascular, weight management and stress management.

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