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Reversal of Metabolic Syndrome Through Lifestyle Changes

Dr. Ray Strand

Dr. Ray Strand is a graduate of the University of Colorado Medical School. He finished his post-graduate education at Mercy Hospital in San Diego, California, and has been involved in private family practice for more than 30 years. Most recently, he has focused his practice on preventive and nutritional medicine.

Dr. Strand has written several books, including his most recent, *Releasing Fat*, which presents information about the glycemic index and healthy lifestyle habits that can help the body release fat. He has lectured on the subjects of nutritional supplements, the glycemic index, and healthy lifestyles across the United States, Canada, and Australia.

Combating Metabolic Syndrome

Type 2 diabetes has reached epidemic proportions in the United States and other industrialized countries.[1,2] However, recent research has shown that the disease is highly preventable, and that lifestyle changes in diet and physical activity are effective in preventing this condition.[3,4,5] These lifestyle changes are thought to be especially effective in people with metabolic syndrome, a pre-diabetic state that involves multiple symptoms, including overweight and central obesity, insulin resistance, elevated blood lipids, elevated blood glucose, and elevated blood pressure.[6]

For these reasons, USANA Health Sciences and Dr. Ray Strand, a family practice physician and an expert in nutritional medicine, conducted a clinical trial to determine whether a 12-week lifestyle modification program of low-glycemic foods, modest exercise, and nutritional supplementation could reverse symptoms of metabolic syndrome.

Trial Methods

This 12-week study recruited 25 people, aged 20 to 65, who were at risk for developing metabolic syndrome. Men who participated in the study had a waist measurement of 40 inches or more; women had a waist measurement of 34.5 inches or more. All participants also had two or more of the following symptoms: elevated blood pressure, elevated triglycerides, elevated fasting glucose, and low HDL cholesterol levels.

The first four weeks of the program consisted of the following:

Drinking a low-glycemic shake for both breakfast and lunch
Eating one low-glycemic nutrition bar for a snack
Eating one regular, low-glycemic snack
Eating a regular, low-glycemic dinner
Taking a multivitamin-mineral supplement each day
Exercising 20 to 30 minutes, five days per week

The final eight weeks of the program consisted of the following:

Drinking a low-glycemic shake for breakfast
Eating one low-glycemic nutrition bar for a snack
Eating a regular, low-glycemic lunch and dinner
Eating one regular, low-glycemic snack
Taking a multivitamin-mineral supplement each day
Exercising at least 45 minutes a day, five days a week

Study Results

Twenty-one of the 25 participants closely followed the dietary and exercise requirements of the 12-week study. Nevertheless, all data is included in the following study results, which show the program had a dramatic impact.

Dr. Tim Wood

Dr. Tim Wood is USANA's executive vice president of research and development. He holds a Ph.D. in biology from Yale University and a Master of Business Administration in technology management from the Gore School of Business. In all, he has been managing research and development programs in the biological sciences for more than 25 years.

Dr. Wood joined USANA Health Sciences 10 years ago, and now directs a team of more than 35 scientists in the development, testing, and registration of the company's nutritional supplements and functional foods.

Toni McKinnon, RN, CCRP

Toni McKinnon holds a bachelor's degree in nursing and is certified as a clinical research associate. She is responsible for the management of USANA's clinical trial research program, overseeing both in-house and contract research studies. She is also the manager of USANA's science information services department.

On average, participants lost 13 pounds of body weight. Four subjects lost 25 pounds or more. Participants also saw significant declines in BMI and waist circumference. Even more impressive, however, were the changes to participants' cardiovascular and metabolic health. On average, study participants achieved the following results:

- Systolic blood pressure dropped nearly 8 percent; diastolic blood pressure dropped 6 percent.
- Total cholesterol levels dropped 15 percent.
- LDL cholesterol levels dropped 17 percent.
- Insulin sensitivity significantly increased by 14 percent.
- Fasting blood glucose levels declined slightly.

All of these changes are consistent with a reversal of Metabolic Syndrome and with significant improvements in cardiovascular and metabolic health. They are also consistent with a dramatic reduction in the risk of developing type 2 diabetes. The continuous health changes observed during the study also suggest that if the lifestyle program were extended, further health improvements could be expected.

USANA scientists and Dr. Ray Strand concluded that the lifestyle changes employed in this study, including low-glycemic foods, nutritional supplements, and modest increases in physical activity, offer a valuable approach for reversing Metabolic Syndrome and reducing the risk of developing type 2 diabetes and heart disease in at-risk people.

References

(1) Mokdad AH, et al. 2000. Diabetes trends in the U.S.: 1990-1998. Diabetes Care 23:1278.

(2) Narayan KM, et al. 2003. Lifetime risk for diabetes mellitus in the United States. JAMA 290:1884.

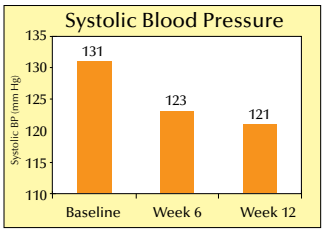
(3) Diabetes Prevention Program Research Group. 2002. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med 346:393.

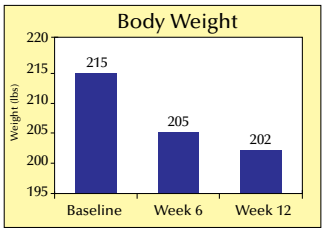
(4) Tuomilehto J, et al. 2001. Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. N Engl J Med 344:1343.

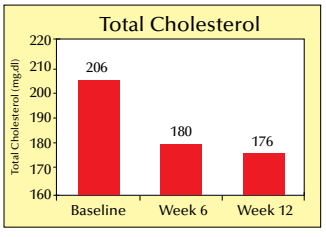
(5) Pan XR, et al. 1997. Effects of diet and exercise in preventing NIDDM in people with impaired glucose tolerance. Diabetes Care 20:537.

(6) Reaven G. 2000. Syndrome X. Simon and Shuster, NY. 284 pp.

Results for the changes in systolic blood pressure, body weight, and total cholesterol are shown in the three graphs below. In all cases, the changes from Baseline to Week 12 are statistically significant at the $p \leq 0.05$ level.







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