**INTRODUCTION**

The experiments we are about to conduct are a series of tests based on the *Breathe Right Nasal Strips*. This product, as many of people have probably seen, is marketed to enhance a person’s respiratory capability by decreasing nasal airway resistance. As advertised by *Breathe Right,* the strip is drug-free, non-prescription, and is to be worn on the nose to gently open the nasal passages and to make breathing easier. Also, each Breathe Right nasal strip is made of two, flat parallel bands of plastic embedded in a special adhesive pad. And when worn the right way the bands try to straighten, gently lifting the sides of the nose and widening the space in the nasal valve. If this is true then as a person wears one of these strips their many respiratory variables will have a tendency to fluctuate, especially when put through various amounts of aerobic activity. After exercise, a subject’s ability to recover to their normal relaxed state would be faster if wearing a nasal strip.

For our tests we will look at three main variables that help prove the advertisements correct. Tidal Volume is defined as the amount of air inspired and expired in one breath. We will use a Spirometer, which is an instrument that measures the amount of air a person can maximally inspire and expire. We will record the subject’s tidal volume at a relaxed state, then set the person into aerobic activity; we will again record the tidal volume directly after exercise and every third minute after that until it reaches normal again.

Another variable was blood pressure, or the amount of pressure the blood exerts on the artery walls when contracted, also known as systolic pressure. And the pressure exerted on artery walls when the heart relaxes between beats; also known as the diastolic (a healthy reading is anything below 140/90). The first number of the reading is the systolic and the second number is the diastolic. We will test it before and after exercise and every third minute until it comes back to the initial pressure.

The last variable we will test for is pulse rate/heart rate. We will test their pulse before and after aerobic activity and every third minute until back to normal. The average pulse rates for humans’ range from between 50 – 85 a minute. The normal rate for the average man is about 72 beats per minute, while the normal rate for the average woman is slightly higher at about 76 – 80 beats per minute.

All our tests are parallel to each other as far as each person will be tested with and without the nasal strips as to include a control.

It is known that through extensive periods of aerobic activity or exercise a person’s heart rate is increased due to lack of oxygen being supplied to the cells. The strips will help the subject breathe easier through their physical exertions. Also, a subject’s blood pressure will increase as well with the physical activity. We expect the tidal volume of a subject at the time of relaxation to be more than that after the exercise. With all this in mind, we hope to prove that with the involvement of the *Breathe Right* nasal strips, all these variables will go down, but in the case of the tidal volume, it will go up.

Also for our test, we will have an adequate sample size of about 30 people. These subjects will be of various masses; our first ten subjects will be within 85-130 lbs. The second group will be within the 131-176-weight class. And the third weight group will be of people weighing within 177 and up. The use of different masses will help determine if the strips really work, because the larger the person the more air the subject will need to have inspired and expired. This will help us in making the data more reliable and more statistically significant because if n is greater than 30, then the normal distribution applies to the data.

Today, the Breathe Right strips are used by more than 250 professional football players. Perhaps the best known one is the spokesman for the strips, Jerry Rice. He feels that the Breathe Right strips really “*elevated his game* and allowed for *recuperating faster*” (Breathe Right).

Besides football, many other athletes in many different sports have tried and successfully used the Breathe Right strips:

Another spokesman for the Breathe Right strip is Tom Dolan, *"I first heard about Breathe Right® nasal strips at the Big Ten swim meet in February 1995. The meet announcer, who was very familiar with the product and my breathing difficulties, told me about them. I noticed a difference immediately and swam extremely well that day, setting the Big Ten record in the 400 Individual Medley."*

In today’s sports world, running is considered to be one of the hardest sports on your respiratory system, but with the help of the Breathe Right strip an athlete can get through the strenuous activity.

*"Breathe Right® strips help me breathe easier through my nose. And because breathing is easier with the strip, I use less energy. I can use the saved energy later when I need to pick up my pace or need an extra kick." —* Ronaldo da Costa.

Besides athletes, many average people use this product to help them with their sleeping behaviors, such as, snoring, etc. Also, Breathe Right strips are used to relieve nasal congestion due to colds or allergies.

Respiration is the name for the chain of biochemical reactions in cells, which release energy from nutrients. Aerobic respiration uses oxygen from red blood cells supplied via the lungs, to produce energy in the body’s cells. Aerobic exercises include swimming, cycling, and jogging, which make your lungs and heart work harder to supply enough oxygen. An aerobic respiration occurs during short burst of activity such as sprinting or weight lifting. The muscles use so much oxygen so quickly that they must rely on a different biochemical pathway. This causes wastes like lactic acid to build up in the muscles. Because a hardworking muscle may use up to 50 times more oxygen than when it is resting, we believe the Breathe Right nasal strips will supply the body with more oxygen than usual during aerobic activity.

Inside your body, the circulatory system plays a part in respiration by delivering oxygen to the cells and removing carbon dioxide from them. Without a steady supply of oxygen carried in the blood, the cells would die. Breathing is completely automatic. It continues through consciousness and sleep without having to make any active breathing effort. We can vary the rate of breathing, as usually happens when we stop to think about it, and we can consciously breathe more deeply. What we cannot do is to stop breathing altogether for much more than a minute. If you hold your breath for long enough, your body takes over and it becomes impossible to avoid taking a deep breath. A part of the brain that controls all our important body functions automatically sends nerve impulses down the spinal cord to the diaphragm and muscles, instructing them to contract regularly. We can override these instructions, but only for a little while. The rate and depth of breathing is also controlled chemically. During exertion, muscles increase their production of waste carbon dioxide, which begins to build up in the blood. The control center in the brain detects this increase in carbon dioxide and steps up the rate and depth of breathing to flush out the unwanted dissolved gas through the lungs. Yet another similar mechanism measures the oxygen level of the blood through a chemical detector in the side of the neck. This detector passes nerve instructions to the brain to speed up or slow down the rate of breathing (The Lungs and Breathing1 28-29).

The chest and lungs do not breath on their own, they need to be coordinated with other body processes. For example, when your muscles are very active, you must breath harder to supply them with more oxygen. This coordination is carried out through the control center of the body, the brain. The breathing control center or respiratory center is the brain stem. To control the depth of breathing, the respiratory sends electrical signals along the nerves to the diaphragm and chest muscles (The Lungs and Breathing2 18-19). The center acts on information it receives from various censors in the body. For instance, during exercise, the body’s muscles produce more carbon dioxide, which builds up in the blood. Censor cells in the brain stem and other sites in the body detect the carbon dioxide level. Also, strain receptors in muscles and joints, called proprioceptors, detect body movements. They feed signals back to the brain, to affect breathing rate (Lungs 18).

The Breathe Right Company and their marketing department claim the strips decrease nasal airway resistance by 31%. But because the narrowest part of the nasal passage is higher up on the nose, most experts (the Board & Editors of Running & Fitness) disagree with those claims. There are many professionals and scientists that have thought the strips to be faulty, but that is what we are going to find out.

Some other disagreements come from physicians. For example, Fred Hatfield, Ph.D. FISSA, President, International Sports Sciences Association, says that Breathe Right nasal strips offer little sports performance advantage. Another skeptic of the strips would be the University of WV, where they reported that in a clinical study they found no difference in the endurance or physiological results of the athletes who performed a maximal stress test with or with out the Breathe Right nasal strip.

There are supporters of the strips that say that during anything more than mild exertion we tend to breathe through the mouth, and not the nose. And the use of a mouth guard in sports, may possibly reduce the airflow through the mouth, and thus, make a strong case for the nasal strips.

For our experiment, we will set out to find the answer to this mysterious question. Do the Breathe Right Strips really work? You can’t really tell unless you have done the experiment for yourself because it could all be the mind state that you have when wearing the strip.