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Keep Calm and Breath: Living with Asthma

Asthma has been around dating back to almost five thousand years ago. The earliest record of asthma was 2600 B.C in China. Asthma was considered a disorder and was described as noisy breathing, or also known as wheezing. The Chinese believe that the best remedy for asthma was for the sufferer to inhale certain herbs that contains ephedra. Ephedra is a drug that can help improve one's breathing. Today, ephedrine is used in asthma medication.

The term *asthma* originates from the Greek work, *aazien. Aazien* is defined as to pant to exhale with the open mouth, sharp breath. The expression asthma was shown for the first time during the Greek epic poem, The Lliad, when explaining the siege of Troy. The first time asthma was used as a medical term was also by the Greeks. Hippocrates' Corpus Hippocraticum is the earliest text where asthma was defined as a medical term. Hippocrates wrote that respiratory disease was more likely to happen to anglers, tailors, and metal workers. After Hippocrates, various physicians and clinicians began to use the term asthma. Like the ancient Greek master clinician, Aretaeus of Cappadocia wrote clinical description of asthma. He described asthma as a bronchial obstruction and that treatment for it was to mix owl's blood with wine.

In Beligum, Jean Baptiste Van Helmont (1579-1644) stated that asthma originates in the pipes of the lungs. In Italy, Bernardino Ramazzini, who was known to some as the father of sports medicine, discovered the link between asthma and organic dust. He is also known for recognizing exercise-induced asthma. Doctors in Rome described asthma as the inability to breathe without making sound. In Rome, it was observed that pollen was a source of respiratory difficulty and like the Chinese, it was recommended to use ephedrine but put the medicine in red wine. Unfortunately, suggested remedies from the Romans were drinking the blood of wild horses or eating millipedes soaked in honey could cure one's asthma symptoms.

In the beginning of the twentieth century, asthma was seen as a psychosomatic illness. This meant that people believe that asthma was caused or aggravated by a mental factor such as stress. From 1930 to 1950, asthma was considered one of the hold seven psychosomatic illnesses, which was discovered by Franz Alexander. It wasn't until the 1960s, where asthma was looked at as an inflammatory disease. The 1960s was the time where anti-inflammatory medication began to be prescribed to patients. It's definitely interesting how much we have advanced medically. We have come a long way in understanding what asthma is all about and how to treat it.

With the history of asthma and its various remedies, I'd like to relate its findings with a quote by Confucius:

"Our greatest glory is not in never failing, but in rising every time we fall."

In this quote, Confucius' tone is filled with pride. These various time periods and places in the world would describe what asthma is and what the best treatment options would be. There might have been a few obstacles in the road that lead to failure while researching about asthma. However the various people who were involved in knowing about asthma and finding its treatments did not give up.

Today, in the United States alone, there are over twenty-five million people that suffer from asthma. The number of those diagnosed increase drastically every year according to the Center for Disease Control and Prevention (CDC). First of all, what is asthma? Well, asthma is a chronic respiratory disorder and can be life threatening. It is where there is inflammation in the lungs, which causes the airways to narrow and swell, mucus production is increased, breaths are shorten, tightening of the chest, coughing, and wheezing. Asthma does not only affect the lungs, it can affect other parts of the body like the mouth. Asthmatic patients are at an increased risk for the following: dental caries, dental erosion, periodontal diseases, and oral candidiasis. Who can get asthma? The CDC estimates that about one in twelve people, in the United States alone have asthma. Even though everyone is susceptible of being diagnosed with asthma, it is more common in children than adults.

In relation to my paper, we can look at the last stanza of Robert Frost's *The Road Not Taken:*

I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I-
I took the one less traveled by,
And that has made all the difference (Frost, 1916)

--Frost began the last stanza with his initial tone of sorrow and remorse. However, Frost ends the poem with "has made all the difference". This suggests that even though the traveler chose the road that was less traveled by, they do not regret their choice. Although asthma can cause daily obstacles in an asthmatic patient's life, they can have a normal life. I have interviewed a couple of dentists and also followed a couple of asthmatic patients during the semester. Throughout the semester, I came up with different possibilities to prevent oral health problems related to asthma with my subjects.

What can trigger an asthma attack? There are different types of asthma, each which can be triggered by various things. It is important to know what can trigger

an asthma attack. There are several types of asthma; First, allergic asthma is the most common type. Obstruction of the airways and typical asthmatic symptoms are associated with allergies. It is triggers by allergens like pollens, molds, dust mites and animal dander.

Next is non-allergic asthma, one third of asthma sufferers are diagnosed with this type. Symptoms can be occur from viral infections or other irritants like tobacco smoke and strong odors or sprays. Another type of asthma is exercise induced, which can also be known by health care providers as exercised induced bronchoconstriction. The result of narrowing of the airways and the other asthmatic symptoms can happen from exercising. Exercised induced asthma can worsen one's asthma or one can have symptoms when one exercised. It is important to know that exercising does not cause asthma, but it is a trigger that makes one have asthma symptoms. The next type of asthma is occupational. One's work environment can put one at risk for an asthma attack. There are work related exposures like dust or chemicals that can cause or worse asthma. This can be a result from either a direct irritation to the lungs or a sensitization from the substance.

Cough variant is another type of asthma, which can be known as CVA. Although, cough may be a usual symptom associated with asthma, coughing alone can be the only symptom present in an asthmatic patient. When it comes to asthma, one would think that medication induced asthma is possible. However, in a small percentage of asthmatics, medication can worsen their asthma or even be fatal. Asthmatics with this type of sensitivity should stray away from medications like ibuprofen, naproxen and diclofenac, which it is possible for an attack to occur after consumption. If one experiences wheezing, coughing, tightness of chest or shortness of breath at night, it might be possible that you have the type of asthma called nocturnal asthma. Majority of asthma sufferers, almost seventy-five percent, experience symptoms at night at least once a week. However, at least forty percent of asthmatics can experience symptoms almost on a nightly basis. The last type of asthma is glucocorticoids resistant asthma. Glucocorticoids are considered one of the most potent anti-inflammatory drugs on the market and very effective in treating asthma. However, there is a very small group asthmatics that do not respond to these medications and are normally labeled as "steroid resistant".

Although there are several types of asthma and their various triggers, some triggers cannot be categorized. One would not think that emotions could trigger an asthma attack. In fact, when an asthmatic person has strong emotions, this can increase rapid breathing. For example, strong emotions like heavy laughing or intense crying can change one's breathing patterns and restrict airflow. This can be described as a form of hyperventilation, which can trigger an asthmatic response. Stress, both personal and work-related, can also trigger an asthma attack. The feeling of being overwhelmed by stress could cause for one's chest to tighten. For asthmatics, it is possible that this can lead to a full-fledged attack. Other emotions that could trigger an asthma attack are anger, fear, yelling, and anxiousness.

Air pollution is a major asthma trigger. Two of the three asthmatic patients that I have been following this semester recently moved into very air polluted areas. In the short amount of time living in a very air polluted area, their asthma symptoms worsen. I know when I first started to commute into New York City; my asthma symptoms would worsen every time I inhaled. I believe for my first semester of commuting, my rescue inhaler and I were attached at the hip. So I understand that air pollution is problematic to asthmatics including my patients and myself.

In the article, "Breathe Wheezy: Traffic Pollution Not Only Worsens Asthma, but May Cause it", there were findings that showed the correlation between childhood asthma and roadway traffic. A recent study conducted by the University of Southern California discovered that in Los Angeles County, 8% of childhood asthma cases could be attributed to roadway pollution. This was because their homes were two hundred and fifty feet away from a busy roadway. When the findings of the study were released, it was underestimated by other research of the effects of roadway pollution on asthmatics. These findings prove that air pollution is very bad for those with asthma but can also cause asthma to develop in healthy children. USC researched wrote that there were new laws in California to help reduce carbon output such as improving fuel efficiency and promoting mass transit. These new laws were set in motion to help reduce asthma triggers for those asthmatics who live near major roadways.

There was another related study conducted but in Europe, where researchers followed more than fourteen thousand children from birth to their teens. This study followed kids from Germany, Sweden, and the Netherlands. They discovered that children that were born in communities with more polluted air were more likely to develop asthma. While there is previous research that has linked asthma to air pollution exposure in early childhood, this study offers new evidence that the correlation extends into adolescence.

Another study was conducted to see the acute respiratory health effects of air pollution on children with asthma that live in U.S. inner cities. So the purpose of the study was to see the correlation between air pollution and the rise of childhood asthmatics in inner cities. It was thought that asthmatic children that live in inner-city communities are more susceptible to having adverse effects of air pollution. This was for two reasons; exposure to somewhat high levels of emission from motor vehicles and their respiratory disease. The study consisted of eight hundred and sixty one children that had persistent asthma in seven U.S. urban communities. They also measured all pollutants and discovered that it was below the National Ambient Air Quality Standards. This study lasted over the course of two years. The study concluded that when there was a short time increase in pollutants, there was an adverse reaction in the asthmatic children in the inner cities.

Not only in the United States, there was a related study about the correlation between urban air pollution and emergency admission for asthma in four European cities. In Barcelona, Helskinki, Paris, and London between 1986 and 1992, there were daily counts of asthma admissions and visits to the emergency room in both adults and children. There were multiple variables considered in this study such as changes in temperature and humidity, viral epidemics, day of the week effects, and seasonal and secular trends. The results were like the pervious study, it was discovered that an increased level of nitrogen dioxide in adults and sulphur dioxide in children would cause adverse effects on their asthma. It is believed that nitrogen dioxide and sulphur dioxide are important in asthma exacerbations in the various European cities.

Although we know what asthma can do to one's lungs, what can it do to one's oral health? According to Delta Dental, dentists are reporting that asthmatic patients are mouth breathers. With a combination of mouth breathing and in take of certain asthma medications, it can reduce saliva flow. This can cause one to have dry mouth, which increases one's chance for dental caries and bad breathe. In addition, the use of inhalers may irritate the roof of one's mouth and can cause red legions. If not treated, they can become infected and spread throughout the mouth and throat. Similar to Delta Dental, The American Dental Association released a publication on how medication can affect your oral health negatively. They advise you that the dental office has your most update to date health history. The American Dental Association explains patients that use oral inhalers for asthma increase one's chance of developing dry mouth, which can irritate the soft tissues in the mouth and make them susceptible to both inflammation and infection. It also increases the chance of oral thrush, which is an oral infection. The oral infection is usually self-diagnosable because white lesions appear on the tongue or inner cheeks. It is advised to rinse your mouth out after inhaler use to decrease chances of this happening.

In various studies conducted by Malin Stensson, her thesis was that young people with asthma have a greater risk of developing caries and suffer more often from gingival inflammation than people of similar age without asthma. In her thesis, there was examination of various people whose ages ranged from three years old to twenty-four with or without asthma. In her first study, it was discovered that three year olds who suffer from asthma had more caries than a three year old without asthma. Malin Stensson explained, "The children with asthma had a greater tendency to breathe through the mouth; they became dry in the mouth and were therefore given sugary drinks more often. This may have contributed to them developing higher caries prevalence." Another study was conducted where they compared the oral health of adolescents aged twelve to sixteen years old who had long-term moderate or severe asthma with that of adolescents of the same age who did not have asthma. The outcome of the second study was the same as the first study; those with asthma suffered more often from gingivitis and had more dental caries than those without asthma.

Once the type of asthma and its triggers are know, one can figure out how they can manage the disease. One way is to treat asthma is through medication. Asthma medications have two main objectives: control and also reduce airway inflammation and reopen the airways. There are various types of medicines on the market to treat asthma. Each medicine is different and will work for different types of asthma.

The types of asthma medications out there and usually are prescribed are bronchodilators, anti-inflammatories, antibiotics, vaccinations, and combination of medications. Bronchodilators help relax the muscles surrounding your airways during an attack. There are two types of Bronchodilators that you can be prescribed to you: short acting and long acting. Short acting bronchodilators are meant to work quickly after you take them so you can feel relief from an attack quickly. Examples of quick-relief/short acting medicines are Proventil HFA, ProAir HFA, Ventolin HFA, and albuterol. The medicine is usually inhaled directly into the lungs. When inhaled, the medicine will then open up the airways and relieve asthmatic symptoms. Long acting bronchodilators are used for long-term use and should not be used for rapid relief. Long-term controller medicines normally come in either inhalation form or pill/liquid form for swallowing. Some examples of long-term controller medicines are Singulair, Flovent, Afvair, and Symbicort. Long acting bronchodilators are recommended when combined with an anti-inflammatory medicine for asthma. Anti-inflammatories, also known as corticosteroids or steroids, are prescribed to help reduce swelling and mucus production in the airways. When the swelling and mucus are reduced then it is easier to breathe. Asthmatic people can have flare-ups during an attack. This is where in the lungs; there is an increase production of mucus. This increased production clogs the airways and the muscles surrounding the airways begin tightening up, which cause the airways to narrow. In some cases, flare-ups are caused by either bacterial or viral infections. One's healthcare provider may give a prescription for an antibiotic or anti-viral. With asthma, one is at a greater risk for grave complications from influenza and pneumonia. It is recommended for an asthmatic person to be vaccinated every flu season.

These medicines are not magic and will not cure your asthma, however, they will help improve one's symptoms and one with asthma will be able to breathe better. They will help an asthmatic person if used properly. One can learn how to properly use their medication from various sources. One way is that one's healthcare provider will instruct you how to properly use asthma medication like an inhaler. Another way is the American Lung Association and the Center for Disease Control and Prevention have videos on their websites on how to properly take asthma medications.

It is known that treatments for asthma can include medications like emergency and long-term inhalers. However, there are some asthmatic people that do not see any change in their asthma symptoms with medication and turn to natural asthma remedies or breathing exercises.

For example, an alternative to medicine is the intake of herbs. On the natural health market, there are two herbs that offer relief with hardly any side effects. The first herb is called Khella, which is commonly called bishop's weed; it works as both a vasodilator (which dilates the blood vessels) and bronchial dilator (dilates bronchi and bronchioles). Khella is caffeine-free and won't affect the adrenal glands like corticosteroids do. Corticosteroids are asthma drugs that are designed to mimic the hormone cortisol, which adrenal glands produce naturally. This type of medication is normally used to counteract inflammation in conditions, such as asthma. People who use this, their body will often produce less of the hormones, cortisol and aldosterone, naturally. Cortisol is a hormone that helps the body respond to stress, regulates both blood pressure and metabolism, and helps recover from various infections. The hormone, Aldosterone, helps to maintain the right intake of salt, potassium, and water going in and out the body. This will often result in adrenal insufficiency. It can be treated with medication that will replace cortisol and/or aldosterone.

With a side effect like that, people turned to the herb, Khella. The herb also acts to smooth and strengthen the heart muscles. This will enable a stronger heartbeat. It even helps the gallbladder with bile flow and can help to eliminate urinary tract stones. It is not recommended to use Khella during an asthma attack. However, using Khella daily is recommended for minimizing acute attacks. Khella can in many forms like tinctures, tablets, or even as a tea. Another herb used for relief for asthma symptoms is known as Lobelia or Indian tobacco. A couple of years ago, it was banned by the FDA. The FDA believed that it was toxic for consummation, however, that could only happen if you take an unimaginable dose in a short amount of time. The famous herbalist, Dr. John Christopher, deems Lobelia as one of the world's most powerful healing herbs and often used it for relieving acute asthma attacks. Lobelia gives immediate relief to those that have excess congestion and breathing difficulties often associated with asthmatics. Lobelia comes in two forms; tincture or vaporizer.

Breathing exercises are another way that people try to lessen their asthma symptoms. In a paper entitled, "Breathing Exercises For Asthma", Mike Thomas and Anne Bruton explain how the role of breathing exercises can help with asthma management. In their paper, patients were interested in non-pharmacological treatments to improve their asthma control. Breathing control exercises were the type of treatment that the patients were interested in. However, the evidence for breathing control exercise was deemed inadequate. The replacement of medication for breathing exercises has been controversial, due to the fact that the claim that it has very effective has been exaggerated. Thomas and Bruton believe that breathing control exercises should be an add-on to asthma treatment.

There are several different types of breathing exercises to help asthma symptoms. One of the breathing exercises that I came across that was deemed one of

the best was Buteyko Breathing Therapy. Konstantin Buteyko, a European psychologist, developed this breathing technique in 1952 after finding the link between hyperventilation and asthma. Buteyko believed that taking slow, shallow breaths were more effective during an asthma attack rather than taking deep breaths. Buteyko's method is very simple. It can be done almost anywhere and no equipment is needed. This breathing technique can be done in any position. For example, if one is sitting, they should keep their back straight and feet on the floor. Then place the tip of their tongue against the roof of their mouth and keep it there throughout the entire exercise. During this exercise, one will be exhaling through their mouth and tongue. For effective results, one should do this exercise at least two times a day.

Buteyko's breathing technique was known in the 1990s throughout the United States, the United Kingdom, and Australia. However, it then became popular in 2009 after Jane Brody, a writer for the *New York Times,* wrote an article about her friend that was able to cut down on using asthma medication after three months of this breathing method. In 2003, there was a study conducted in the United Kingdom that determined that asthmatic patients that used the Buteyko method were able to reduce use of their asthma medications. The study gave the method a "B" rating on effectiveness.

Another type of breathing exercise is diaphragmatic breathing or also known as tummy breathing. This breathing technique maximizes airflow into one's lungs. One can either lie down or be seated. It is preferred that one should breathe slowly through their nose. When one inhales, their stomach should go out not their chest. One should then exhale slowly with their stomach going inward. It is ideally that the exhalation be twice as long as the inhalation.

Another example of exercise that helps one's breathing is yoga. In a study conducted by Demeke Mekonnen, MD and Dr. Andualem Mossie, PhD, there was a preliminary controlled trial on the clinical effects of yoga on asthmatic patients. The study was based in Jimma, Ethiopia; where asthma is one of the most common respiratory diseases. However asthma medication in Ethiopia is very expensive. So alternative asthma treatments are preferred.

The study consisted twenty-four volunteer asthmatic patients. The volunteers were then group in yoga and control groups. An Indian yoga expert was brought to teach these patients on yoga practice, yoga posture, and slow breathing technique. Then, the groups were supervised over a course of four weeks while performing yoga exercises for fifty minutes every day. At the end of the study, it showed that were was a sixty-six point seven percent reduction of medication. In conclusion, yoga exercise among asthma patients resulted in reduction of asthma symptoms. It also showed a great improvement in airflow.

Although the study above gave positive reviews about yoga, another study conducted in 2014 says other wise. The efficacy of yoga alleviating asthma is inadequate. Holger Cramer, a director of yoga research, led the study and analyzed previous studies that tested yoga and its benefits for asthmatic patients. Their results were based on the patients' number of asthma attacks and use of their medication. Their research proved that yoga improved lung functions and asthmatic symptoms by very little.

With these three breathing techniques, I decided to try one of them out this weekend. My asthma tends to act up when I have strong emotions. For example, my parents were leaving for a three-week trip. This is probably the first time in my nineteen years of living where my parents have left me alone for more than two days. So the separation anxiety began to kick in the week before they left. I was definitely overthinking about them leaving because my symptoms began to worsen over the course of the week.

Then the day came that they were leaving and my asthma symptoms were terrible. I needed to have asthma treatment every two hours. I decided to try out the Buteyko's breathing method and I have to say it was very helpful. I will be testing it out the next two weeks and monitor myself before I ask my patients to try it out.

Some times, people believe that medications control their life. Their way of controlling their asthma symptoms is changing their diet. It is said that it is better asthmatic patients to go on pescaratian, vegetarian, or vegan diets. In a Swedish study conducted in 1985, it consisted of thirty-five subjects that had asthma. Their ages ranged from two years old to thirty-three years old. For one year, these thirty-five subjects would be practicing a vegan diet. At the beginning of the study, it was discovered that one subject had asthma as a child. So that subject was dismissed. Six weeks into the study, one of the subjects passed away from a myocardial infarction. Two months into the study, nine of the thirty-five subjects decided to give up their vegan diet and were dismissed from the study. By the end of the year, there were twenty-four subjects still participating in the study. When the one-year study was over, it was discovered that their need for medication and frequency and severity of asthma attacks were decreased. It was recorded that only two out of the twenty-four subjects saw no significant changes to their health.

Researching more on plant based diets, I discovered an article by Katricia Kelly. In her article, "How I cured my Asthma Naturally & Why I'll Never Use An Inhaler Again", Katricia Kelly explained that diets that were high in meat can trigger asthma. Asthma triggers can be anything including food. Although they don't affect everyone, certain foods and drinks like eggs, soy, alcoholic beverages, processed foods, and food coloring can cause asthma. An asthmatic person should be on a diet that consists of fresh fruits, vegetables, nuts, oats, brown rice, and whole grains. It's also ideal that there should be a significant amount of protein included in their diet. Kelly, who was asthmatic, immediately started to incorporated vegan meals into her

diet until she was comfortable with the transition. Within the first thirty days, seventy-five percent of her meals were vegan and began to see results. She did not need to use her inhaler and was determined to not use it ever again.

In a similar article, "From Meds to Marathons: How Eating Whole Plants Reversed My Asthma and Eczema", Rob Dube was diagnosed with asthma as a young child. Dube was immediately put on various types of asthma medications. He described that these various medications made him feel out of place and jittery. He did not want his asthma or medication slow him down, however, he struggled. While in college, Dube described that he was put on "better" asthma medications and was prescribes a recuse inhaler, which he constantly used. He also developed Eczema all over his body.

Rob essentially felt helpless and frustrated, multiple trips to the doctor and being prescribed various medications that didn't even work. It wasn't until 2008, Rob was inspired by one of his coworkers to train for a marathon. After he completed the marathon, he caught the running bug and was determined to improve his running. He began to study nutrition and work on his running performance. He read an article about eliminating red meat from your diet and decided to give it a show. Slowly but surely, he moved onto a vegetarian diet.

In 2011, Dube saw a trailer for the documentary, "Forks Over Knives", which is about researchers exploring the possibility that people can change their diets from animal-based to plant-based. He felt compelled to watch the documentary and found there was a screening in his area. After watching the documentary, Rob wanted to try out the plant-based diet. In just a short amount of time, he began to see that both his asthma and eczema symptoms were not as bad as before. While transitioning into a plant-based diet, Rob was still running and training for marathons. He noticed that after switching to a plant-based diet, his performance and recovery times improved significantly. He was able to wean off his medications and stopped taking them all together with the help of his allergist and nutritionist. It was the first time in thirty-three years that Rob was medication-free.

How to manage asthma is to monitor and assess one's symptoms. There are four key points to monitor and assess, which are daytime symptoms, nighttime symptoms, rescue inhaler use, and activity level. During both the daytime and nighttime, one should be able to monitor if they have any of the following asthma symptoms, such as coughing, wheezing, chest tightness, or shortness of breath. One should also be able to keep track of how much they use their inhaler for instant relief. It is possible for one to use their rescue inhaler while doing normal every day activities like walking up the stairs. It's a good idea to have a journal to monitor the four key points mentioned before. With that journal, one can show their healthcare provider then it could be assessed if one's asthma is getting better or worse.

For me to get a better understanding of how to prevent oral health problems, I decided to visit and interview a couple of dentist in a twenty-five mile radius of my house. The first dentist office I visited was the office of Doctor Larry of Linden, New Jersey. He specializes in general dentistry. Doctor Larry offered to help me out throughout this semester to find patients and said I could shadow him. However, the only problem was that Doctor Larry did not treat a lot of asthmatic patients. The next dentist office I visited was office of Dr. Talbot of Edison, New Jersey. Dr. Talbot is both a pediatric dentist and orthodontist. He was both my dentist and orthodontist. I think the good thing about Doctor Talbot is that majority of his patients are children that are asthmatic. He was able to help me find patients. The interesting part of talking about asthmatic patients with Dr. Talbot was the types of anesthesia. For asthmatic patients, some anesthesia can cause breathing complications for asthma patients. Some anesthetics constrict the airways and this is a big no for asthmatics. That is why dentists have to make sure that they use an anesthetic that will not constrict the airways. I went to another dentist office, which was the office of Doctor Moses. I was able to get a third dentist's opinion on how to handle a patient with asthma. The area where my sister's dentist is located is very air polluted. So majority of his patients are asthmatic. He is a great example on how to handle patients with asthmatic symptoms. Like the other two dentists I interviewed, Doctor Moses also said how asthmatic patients tend to be mouth breathers and combined with asthmatic medications reduce saliva flow. This combination creates dry mouth and increases one's risk for both oral thrush and dental caries.

After interviewing these dentists, I was then able to gather some asthmatic patients. For privacy purposes, I will change the names of my asthmatic patients. The first patient I interviewed was Wanda. She's a sophomore year at NYU. I found out Wanda was not from the New York Area. She is actually a transplant from the Minnesota countryside. She was diagnosed with asthma as a child. She described that as a child she was overweight. Her diet consisted of a lot fatty foods and sweets. So when she was diagnosed with asthma, her parents believed that she did not need to go on asthma medication. They believed that if she lost weight, her asthmatic symptoms would lessen. Wanda's parents signed her up for various sports to help Wanda loose weight and changed her diet. Wanda and her parents believed that it definitely worked at first. However, her asthma symptoms would last more than three hours. So the decision of going on asthma medications was made. Wanda was prescribed to go on a combination of a rescue inhaler and a controller inhaler. Her parents wanted to balance out Wanda's diet, exercise, and medication.

As Wanda got older, she felt that she was very dependent on her medications. She wanted to change that, so she began to cut out meat from her diet and exercise daily. With following this exercise and diet plan; Wanda began weaning off her asthma inhalers. By her senior year of high school, Wanda had completely weaned off her medications and had been a practicing pescatarian for at least four years. During that time, she felt on top of the world. She described it that in the first time in forever that she felt healthy. Later in her senior year, Wanda was accepted into NYU.

Although NYU was her dream school, Wanda was unsure if she would be able to maintain her exercise and diet plan while adjusting and transitioning into college life and moving far away from home. She knew that it was going to be a challenge, but she was determined to not let asthma control her life once more.

Then in August 2014, Wanda headed off to New York for school. The first three months was very difficult on her. She began to have asthmatic episodes almost every week and began to rely on her medications. The transition definitely played a part; she went off her pescatarian diet and stopped exercising regularly. The polluted air in New York City added into the mixture, of course, did not help with her asthma. This continued to worse over the course of the semester. Wanda knew this lifestyle could not continue. As her first semester of college came to an end, Wanda went back to Minnesota for winter break. During that month, she went back on her diet and exercise plan. She knew she had to stick to this regiment. She planned ahead, looked at her second semester schedule and figured out when she could exercise. She also intended to go back on her pescatarian diet. When second semester came around, Wanda followed her asthma management plan. By sticking to it, she began to see improvements over the months and started to wean off her asthma inhalers once more. Wanda informed me her exercise plan includes running at least six miles around Manhattan every day. If she cannot fit running into her schedule, she'll go to the gym to work out.

After getting this asthmatic timeline from Wanda, I asked her about her brushing habits and oral health. It's recommended that you brush and floss at least twice a day. Wanda proceeded to tell me as child, she saw brushing and flossing as a chore. The combination bad brushing habits and asthma caused her to have many cavities and gingival problems. After numerous times of being reprimanded by her dentist, her parents made sure that she brushed and flossed daily. Wanda's brushing habits definitely improved over the years until she went to college. Her freshman year of college, there were times where she would go three to five days without brushing because she "forgot". Her visit to the dentist that year was not a good one. She had inflammation of her gingiva and dental caries. Overcome that challenge of forgetting to brush and floss, she put a daily reminder on her phone and there's a sticky note on her desk and on the bathroom mirror.

The next patient I interviewed and followed was the son of my mom's coworker. Randy is twelve years old and has had asthma since her was nine. Him and his family moved from the Philippines to New Jersey almost four years ago. He was diagnosed with asthma just after a couple of months living in the states. Randy and his family live in an apartment complex in the town next door to mine. The area where they live is very overcrowded and their apartment complex is next to a major highway and grassland. His mother was explaining to me that the combination of air pollution and seasonal allergies made Randy's symptoms worse.

The transition from a less air-polluted area into a very air-polluted area was difficult for him. Both of his parents said that the first couple of months in the states.

Randy would wake up and have trouble breathing. They first tried a humidifier to make his breathing better. The humidifier made his breathing somewhat better, however, they decided it would be better to see an allergist. The allergist prescribed both an emergency inhaler and controlling inhaler while taking daily over the counter allergy medication and allergy shots. This definitely has caused Randy's symptoms to lessen. His mother has been monitoring his asthma and sees that improvement. She told me that Randy would experience an asthma attack daily and now it happens at least monthly.

I then asked what Randy's diet and exercise looked like. His diet was mostly Filipino foods. He really did not enjoy American foods. Filipino foods mostly are a combination of such flavors like sour, sweet, and salty. Like other Asian countries, rice is a main staple of the Philippines. Majority of the time, rice is steamed and will always served with meat, fish or vegetable dishes. Filipinos use a variety of fruits and vegetables in their cooking. Normally the types of fruit used in cooking include bananas, kalamansi, mangoes, and papayas. For vegetables, they normally cook eggplants and green leafy vegetables like cabbage or bok choy. The types of meat include chicken, pork, beef, and fish. Depends on where you live in the Philippines, if you live near the ocean then fish will be a more popular dish served. The most common way to cook meat and fish is to pan-fry or deep-fry then serve with rice. Filipino dishes are mostly served with a variety of dipping sauces. Dipping sauces can include vinegar, soy sauce and kalamansi juice. They can be used separately or combined.

For a twelve year old, Randy looked fairly healthy physically. It was recommended by his allergist that he exercise daily. In the summer, his family would take daily walks after dinner. When it started to get colder, they would play exercise video games on their game consoles like Just Dance or Wii Sports. I would say they are a fit family. They are very goal orientated when it comes to exercising. Then talking about Randy's brushing habits. Due to the fact that the Philippines is a third world country, majority of people do not have access to tooth brushes, toothpaste, and floss. Randy's mom went through that as a child. She has a lot of fake teeth now. So she always reminds Randy and his brother to brush and floss every day. She wants her kids to not end up like her.

For my third subject, I was able to interview and follow my classmate from high school. Like me, William was diagnosed with asthma in high school. He was very active as a child. His parents signed up for various sports like baseball and wrestling. His diet was well controlled. It all changed by the middle of William's freshman year of high school, his mother passed away. William stopped playing sports and food became his comfort. He was telling me how him and his mom were very close so her death really took a toll on him.

By the time sophomore year came around, William gained almost over one hundred pounds. With this dramatic weight change, William would find himself having difficulties doing simple tasks like walking up stairs or exercising. It wasn't

until William could not breathe one day at home and had to be rushed to the hospital. During his hospital visit, William was officially diagnosed with asthma. The doctor told him to go to an asthma doctor to get assessed and figure out what medications would work for him. The only problem was that William's mom had solid job with great health insurance before she passed. His dad was and still is jumping from job to job. So William and his dad didn't have health insurance while he was in high school.

In his case at the time, William had to depend on natural remedies because he did not have health insurance. William's aunt referred him to trying ginger. Ginger is known as a natural treatment for various ailments including asthma. It can help reduce inflammation in the airways and can act as a muscle relaxer. Also like me, William was told that diaphragmatic breathing (figure 1.1) is the best method to help with asthmatic symptoms. However, when William used diaphragmatic breathing while showing symptoms it did not help. His symptoms would last for more than three hours. Even though he did not have health insurance, he needed medication to help control his asthma. He took on a job to help his dad pay for his medication and doctor visits. His doctor just prescribed him a rescue inhaler.

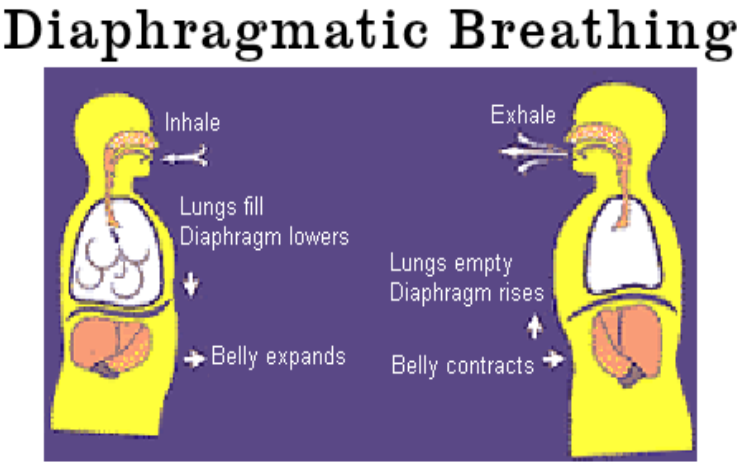

Figure 1.1

William knew he had to change and he felt like he was disappointing his mom. Everything that William did to not let asthma control him was for him and his mom. He began to play sports once again and decided to cut out unhealthy foods from his diet. He used his inhaler in only emergencies. In two years, William really changed his life around. He's slowly shedding off the pounds he gained and eating healthy. His dad was able to get a stable job with health insurance. This allowed William to go to a better asthma doctor and be put on a better medication regime. He was prescribed Singulair and ProAir. Singular is a medication prescribed to adults and children to prevent asthma attacks and exercise-induced bronchospasms. It can also be used to treat year-round and seasonal allergies. ProAir is used for the prevention and quick relief for bronchospasms. It is prescribed to children over four years old and adults. He's been on those medications for the past three years and with a balance diet and exercise plan, William's asthma has been under control.

After getting William's asthma timeline, I asked him about his brushing habits and oral health. Will explained that his brushing habits are not the best. He was actually very embarrassed to tell me his home care. With Will's busy schedule, he forgets to brush and floss. He said that he could go up to three days without brushing and flossing. He really finds it a hassle. With that information, I know that Will has really increased his risk for both oral thrush and dental caries. The fact that

he forgets to brush and floss, he also increased his risk for tooth loss. The plaque in his mouth will build up if not removed. Plaque is a soft, white film on the teeth and it contains bacteria. When plaque is not removed, it can mineralize and become hard. It would be more difficult to remove by yourself. I explained to William about the problems he can face if he does not improve his home care routine. I suggested that William has reminders, either on his phone or in sticky note form, to brush and floss daily.

Before doing this paper and finding the research, I really did think that medications are key to lessen asthma symptoms. However, that isn't whole picture. When it comes to asthma, there are various things that come into play. Asthma not only affects your lungs but also can affect one's diet and oral health. One is not aiming to fix just their lungs. One has to find a balance to fix the entire body.

After doing the research this semester, I felt that I learned about the different puzzle pieces that come together to show the bigger picture of asthma. In conclusion, there is no magical way to get rid of asthma. There are various ways to lessen asthma symptoms. This can be through medication or natural remedies. The way one can treat asthma varies from person to person. A person can be relying on asthma medications their entire life. Another person can rely on natural remedies, but have medications in handy in case of an emergency.

As someone with asthma, this research paper has really opened my eyes to the different possibilities on how to treat my asthma and lessen my symptoms. It really interested me in the different breathing exercises to use instead of medication. For the past couple weeks, I have been using the Buteyko's method. I actually find it very calming in stressful situation where my asthma does act up. I was also intrigued by the fact that some asthmatics tend to eat fish to lessen their symptoms. After discovering these puzzle pieces, it helps me finish the puzzle in a sense. I hope incorporate my research into my every day life.

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