# Exploration of Chiropractic Care for the Management of Asthma:

## Assessing the efficacy of spinal manipulation as a reduction strategy for the frequency and severity of asthmatic attacks

A Literature Review

Travis Impellizzeri
Senior Research
Dr. Mannello
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**ABSTRACT**:

**Objective**: The objective of this literature review is to evaluate and assess the efficacy of various chiropractic techniques in the treatment and management of patients with asthma.

**Data collection**: Data was collected from both electronic databases, primarily pubmed, but also Index to Chiropractic Literature, Chiroaccess, PEDro, and Academic Search. In addition to online medium, several medical and chiropractic journals were utilized, such as The New England Journal of Medicine, Chiropractic Journal of Australia, and Annals of Allergy, Asthma, and Immunology.

**Discussion**: The aim of this article is to discuss the pathophysiology of asthma as an inflammatory process, its somato-visceral relationship with spinal segments, and the effects that chiropractic treatments had on the patients within the case studies.

**Conclusion**: Through several studies of various chiropractic techniques, the research shows that those treated with chiropractic care had a decrease in frequency and severity of asthma symptoms and improved their quality of life.

**Key Indexing Terms**: Asthma, Chiropractic, Adjustment, and Manipulation

## Introduction

Asthma is a chronic inflammatory disease that affects the airways. Its clinical manifestations are generally a combination of cough, dyspnea, chest tightness, and wheezing. Additional physical signs that are present at the time of an attack may include rapid breathing, rapid heart rate, use of accessory muscles, and pulsus paradoxus. The prevalence of asthma has drastically risen within the past three decades on a global scale as reported by the Center for Disease Control. Their estimates in 2010 concluded that approximately 9% of the population suffers from asthma, with slightly higher rates in children. [1] [22]

The asthmatic patient experiences a hyper-reaction to allergens or irritants in the environment. Susceptible individuals that encounter environmental triggers will respond with structural, cellular, and biomechanical changes that force a contraction of the smooth muscle that lines the interior of airways. This inflames the surrounding tissue and causes it to produce a thick mucous. It is this reaction that necessitates treatment.

Chiropractic care, as an approach to treat the asthmatic patient relies on different factors. First, the aim is to affect the sympathetic nervous system. Through adjustments, the hyper-reactive state of the cells, are brought back to a normalized threshold of excitability. For the patient, this means that something that may have previously triggered an asthmatic response, no longer does. Secondly, chiropractic adjustments allow the joints a wider range of motion. Joints within the thoracic spine can become fixated and the muscles strained with chronic asthma attacks. When these are in proper form, patients find it easier to breathe and are less likely to have a stress or exercise induced reaction. [1] [15] [20] [26]

## An Overview of asthma

### Diagnosis and Classification of Asthma

Airway inflammation and hyperreactivity are often present and associated with asthma. However, it is not necessary to demonstrate either in order to diagnose it. The clinical criterion for asthma is in the demonstration of reversible airway obstruction. The clinical manifestations are usually a combination of cough, dyspnea, chest tightness, and wheezing. Increased breathing rate, heart rate, use of accessory muscles, and pulsus paradoxus are physical findings that may also occur.

There are a variety of methods acceptable for demonstration of reversible airway obstruction, traditionally done with use of a bronchodilator. Sometimes, other medications, such as corticosteroids, are used for normalizing pulmonary functions. Pulmonary functions are not always required to diagnose asthma. The patient's history, such as cough and dyspnea occurring after exercise and relieved by bronchodilator, will often be enough to make a clinical diagnosis. Clinical evaluation, such as wheezing and tachypnea that occur with a respiratory infection and reverse with administration of a b-agonist, will also suffice.

Asthma can be classified by one of two means, etiology or severity. Etiology includes extrinsic, intrinsic, mixed, potentially fatal, aspirin induced, occupational, exercise induced, cough-equivalent, factitious and coexisting asthma. The severity category consists of mild, moderate and severe. Patients with mild asthma have infrequent exacerbations of cough, wheezing, and dyspnea. Between attacks, they are

often asymptomatic and have a good exercise tolerance. These patients do not require urgent or emergency treatment of their exacerbations. Their pulmonary functions are generally normal, but they may have decreased mid flow rates. Patients with severe asthma have daily symptoms and require urgent or emergency treatment several times per year. They have poor exercise tolerance. Their pulmonary functions generally show forced expiratory, and peak flows <60%. They may have a poor bronchodilator response due to chronic inflammation. Patients with moderate asthma are intermediate between the mild and severe asthmatics.

The diagnosis and classification of asthma requires a logical and orderly approach. The most important aspect is a complete history. Physical examination, laboratory tests, chest film, and spirometry are useful for corroborating data. [2]

**Outcome Measures in Childhood Asthma and Outcome Measures in Asthma**

Evidence suggests that asthma onset occurs early in childhood and many standard asthma outcome measures are either impractical or unreliable in preschool-aged children. Patient history and symptom reports rely on the observations of caregivers, who can have a tendency to underreport their child's asthma symptoms. The use of traditional measures of pulmonary function such as spirometry may be impractical in very young children. Recent clinical studies have used a variety of techniques to measure symptoms, pulmonary function, and cellular mediators of inflammation. Outcomes such as exacerbation rates, frequency of daytime and nocturnal symptoms, and caregiver assessments of quality of life can be useful measures in evaluating outcomes in young children with asthma. Some measures, such as plethysmography and inflammatory

marker analysis, may be worthwhile options in assessing pulmonary function and predicting asthma susceptibility in preschool-aged children. Altered levels of inflammatory markers, including immunoglobulin E, interleukin-10, and exhaled nitric oxide, may be useful tools in diagnosing asthma, evaluating interventions, and assessing future risks for asthma symptomatology in very young children. Whether one or more of these outcome measures will prove useful clinically in improving the diagnosis and management of childhood asthma remains uncertain, however these early research results are encouraging.

Until the pathophysiology of childhood asthma is more completely understood, asthma symptomatology such as coughing and wheezing is likely to continue as a primary outcome measure in young children with asthma. No single outcome measure is able to provide an accurate diagnosis or evaluation of asthma interventions. The results of recent, controlled clinical studies in asthma suggest that certain non-traditional measures such as tests like the sRAW and alterations in the levels of certain markers of inflammation, including IgE, NO (Nitrous Oxide), and IL-10, are inflammation-sensitive measures and can be used successfully in asthma diagnosis, assessment of asthma therapy, and in evaluating the risk for the development of asthma in very young children.

Again these early findings are encouraging, and whether one or a combination of these outcome measures ultimately will be of routine clinical value remains uncertain. As our understanding of asthma in children continues to improve, the likelihood of identifying reliable, valid, and practical outcome measures in young children with asthma will improve. [3] [4]

**Environmental Triggers of Asthma**

Some of the biggest environmental triggers for asthma have been shown to be indoor air pollution. In industrialized countries, adults and children spend most of their time indoors. Exposure to the indoor air pollutants may have a more important effect on childhood asthma than may exposure to outdoor air pollutants. The primary indoor air pollutants associated with asthma exacerbation include, biologic allergens (dust mites, cockroaches, animal dander, mold, etc.), environmental tobacco smoke (ETS), irritant chemicals and fumes, and products from combustion devices.

Biologic allergens can be found throughout the home, school, and work environments. However, dust mite allergens, mold, and cat and dog allergens can be found in most homes, even homes where there are no pets at present.

Sensitization to house dust mites is an important risk factor for asthma exacerbations and the development of asthma. The dust mite grows optimally at warm temperatures and with humidity greater than 50% in cloth-covered objects such as soft toys, upholstered furniture, bedding, mattresses, and carpets.

Exposure to cats is causally related to asthma exacerbations among many children with asthma. The severity of allergic reactions to cats is greater than reactions to other common domestic pets. More than 6 million U.S. residents have allergies to cats, and up to 40% demonstrate skin test sensitivity. Dogs, rodents, birds, and other furry or feathered animals in the home may contribute in varying degrees to the animal allergens within the home. Dogs may have breed-specific allergens, and are less uniformly allergenic than cats. Rodent allergens can come from pets or pests in the home. Birds and

feathers have been suggested as allergenic; however, it may be that the dust mites associated with feathers (including feathers in pillows and clothes) are the culprits.

Exposure to molds may also lead to allergic sensitization and may exacerbate asthma or allergic rhinitis. At least 60 species of molds have spores thought to be allergenic. Species of particular concern are Penicillium, Aspergillus, Cladosporium, and Alternaria.

On exposure to these species, nasal congestion, runny nose, sneezing, conjunctivitis, lacrimation, wheezing, chest tightness, and shortness of breath may occur. Among patients studied, children are the most sensitive to mold allergens.

Exposure to environmental tobacco smoke (ETS) is a risk factor for asthma attacks in children. Children with asthma and whose parents smoke have more frequent asthma attacks and more severe symptoms. There is clear evidence of an association between exposure to environmental tobacco smoke and the development and exacerbations of asthma. Exposure to ETS also places children at increased risk for sinusitis, otitis media, and bronchiolitis.

The most common occupational respiratory disease in many developed countries is work-related asthma. Approximately 15%–25% of adults with asthma may have work-related asthma (*i.e.*, both occupational asthma that is caused by conditions at work and work-aggravated asthma). The two types of occupational asthma are distinguished as shown below. Allergy-induced asthma arises after a latency period that is necessary for acquiring sensitization. Irritant-induced asthma develops because of acute high-level exposure to irritant materials, and may be due to repeated irritant exposures.

Minimizing exposure to these environmental triggers in addition to the chiropractic treatments to be discussed will decrease the frequency severity of the patient's symptoms. [4]

**The allergic cascade: Review of the most important molecules in the asthmatic lung**

In susceptible individuals, asthma causes recurrent episodes of wheezing, breathlessness, chest tightness and cough. Crucial in the development of airway inflammation in allergic asthma is the allergic cascade. Inhaled allergens that escape the mucociliary clearance are taken up and processed by antigen presenting cells (APCs), which are distributed throughout the respiratory tract, from the nasal mucosa to the lung pleura. These APCs then migrate to the draining lymph nodes where the processed allergen is presented to allergen- specific T and B cells. Interactions between those cells elicit responses that are characterized and influenced by secreted cytokines and the presence or absence of cell-bound co-stimulatory molecules. Activation of T helper (Th) cells by APCs leads to the production of cytokines that regulate the isotype switch of B cells in their production of immunoglobulin (Ig) E. Once synthesized, IgE antibodies circulate in the blood before binding to the high-affinity IgE receptor Fc RI that is present on mast cells in tissue or on peripheral blood basophils. After re-exposure, allergens cross-link to mast cell-bound specific IgE, thus causing the activation of membrane and cytosolic pathways, which subsequently trigger the release of preformed mediators, such as histamine, the synthesis of prostaglandins (PGs) and leukotrienes (LTs), and the transcription of cytokines by mast cells. These mediators cause the so-called early-phase asthmatic reaction (EAR), which is characterized by constriction of

airway smooth muscle (ASM) cells, vascular leakage, mucus production, enhanced airway hyper- responsiveness (AHR) and recruitment of inflammatory cells. This EAR is immediate, lasting 30–60 min and 4–6 h later followed by the late-phase asthmatic reaction (LAR). The late-phase is characterized by excessive inflammation of the airways, resulting in structural changes, including airway wall thickening, subepithelial fibrosis, goblet cell hyperplasia, myofibroblast hyperplasia, ASM cell hyperplasia and hypertrophy, and epithelial hypertrophy. This is collectively known as airway remodeling. [5]

**Reflexology and bronchial asthma**

Many asthma patients seek alternative therapies such as reflexology, homoeopathy and chiropractic manipulation. Reflexology is a specific treatment whereby finger pressure is applied to certain parts of the body, especially the feet, but also other parts of the extremities and regions on the back. It is claimed that a large number of diseases can be treated, but no anatomical or physiological mechanism of action has been described. Among asthma patients, reflexology is a relatively well-known alternative or complementary treatment, and casuistic reports about a positive effect are known among patients. However, the effect has so far never been documented. Since asthma is characterized by asymptomatic periods amongst periods with symptoms, spontaneous improvement as well as outright placebo effects is expected. Consequently, controlled investigations are mandatory. A randomized, double-blind, controlled trial was designed, comparing active with simulated (placebo) reflexology, with the aim to study its effect on

bronchial asthma assessed by clinical symptoms, medicine intake, objective lung function parameters, bronchial sensitivity and quality-of-life questionnaires. [6]

## Case Studies

### A Comparison of Active and Simulated Chiropractic Manipulation as Adjunctive Treatment for Childhood Asthma

The case study I chose to review with was one of the most widely referenced among other texts, reports, and studies. It begins with an attempt to look into chiropractic manipulation being reported to benefit patients with non-musculoskeletal conditions, including asthma. The subjects chosen were 91 children, ages 7 to 16 years old with at least a one-year history of asthma, and used a bronchodilator at least three times per week.

Using objective means of data collection, primarily morning and evening peak expiratory flow at two and four months they concluded that there were no significant differences between the groups (actual treatment versus simulated) in the degree of change from baseline. However, there has been an increase with their quality of life, and a decrease in asthma symptoms, as well as use beta-agonists medication use in both groups. There was no significant difference between the two groups. The report later states that the improvements, in either group could have been due to placebo or study (Hawthorne) effect. [7]

### A Multi-Modal Chiropractic Treatment Approach for Asthma: a 10-Patient Retrospective Case Series

In this series of case studies, a single DC describes the use the chiropractic technique of Applied Kinesiology to treat his patients. There were 10 patients between the ages of 3 and 22-years-old, 7 male and 3 female, all of whom had been medically diagnosed with and treated for asthma.

As the multi-modal description of the study indicates, there were several approaches taken in the care of these patients. Along with the chiropractic manipulation, there were therapies targeting muscles of respiration and nutritional evaluations utilized.

The outcome measures reported were consistent with each patient in that they all claimed to have improvement of their exercise induced symptoms, reduction in respiratory distress and coughing through both the day and night, and all together ease of breathing. In addition, each patient was able to go off their medications within 3-6 visits, without further complications or flare-ups as reported upon follow-up visits. [8]

**Applied Kinesiology Methods for a 10-Year-Old Child with Headaches, Neck Pain, Asthma, and Reading Disabilities**

This is a single case study of a 10 year old, male patient with multiple complaints conducted by Scott Cuthbert DC. The patient has a four-year history of severe exercise-induced asthma. Attempts to manage the attacks with daily use of four medications still gave no relief during exercise where he continued to be symptomatic. Some of his other complaints that were non-musculoskeletal in nature were developmental delay and poor classroom performance and concentration skills.

After treatment 3 weeks of treatment consisting of 5 visits, he was able to discontinue asthma medications with no return of symptoms for the following 2 years,

upon which time the study was reported. The Doctor states that the care delivered to this patient seemed to help resolve his chronic musculoskeletal dysfunction. This is believed to account for his being able to progress with the non-musculoskeletal problems he was encountering. He was now running and playing sports with his peers and reading at his own grade level. [9]

**Chiropractic Care of a Pediatric Patient with Asthma: a Case Report**

The doctor in this case sought to review the outcomes of a toddler suffering from asthma, GI complaints and frequent colds when treated with chiropractic care. The patient is a 23-month-old female with severe asthma (categorized as stage III) as a primary complaint. Prior to seeking chiropractic care she was taking a series of different medications and was under constant monitoring of her pediatric pulmonologist.

The treating chiropractor used a combination of Diversified and Activator Methods adjustments on a frequency of 2-3 times per week for 4 weeks, with a re-evaluation every 12 visits, then 1-2 per week. After 5 months of treatment, the parents note that she is no longer on her asthma medication. She is being treated now once per week as maintenance care, but has had no exacerbations and fewer colds and sinus infections. Her digestive health is now noted to be no longer a problem. [10]

**Chiropractic and Omega-3 Supplementation as Alternative Management for Asthma in a 6-Year-Old**

This is a case study of a 6 year old, male patient with progressing asthmatic symptoms. He was diagnosed at the age of 4, and has been using Albuterol daily and the

Flovent inhaler for the more severe episodes. The patient's symptoms were being partly managed by the medications, but he was still having problems at night.

The patient was treated using Korean Specific Technique and omega-3 supplementation. After the first visit, the mother states that the boy was able to sleep through the night without the use of his inhaler. The patient was treated 5 more times over a 6-month period, and has continued to remain symptom free without use of either inhaler. He plays baseball with his friends and is able to sleep through the night regularly. [11]

**Correction of Subluxation and Reducing of Dysponesis in a 7-Year-Old Child Suffering From Chronic Cough and Asthma: A Case Report**

This is a case study of a 7-year-old, female patient with a 3-year history of severe persistent asthma that has, thus far been uncontrolled. She is on several forms of medication, including 3 oral taken 2 times per day, 3 different inhalers taken up to 4 times per day, each. Even with all of these, she is unable to engage in any physical activities and is still constantly wheezing and coughing, with a persistently tight and heavy chest.

Treatment rendered to this patient began as 2-3 times per week for a course of 3 weeks. After the first visit, she noted that a reduction in her symptoms that night and her coughing had discontinued. During the next 3 weeks of treatment, the mother notes the girl has experienced no asthma attacks, she has had no coughing or wheezing episodes, and the tight and heavy feeling in her daughter's chest has not once been felt. She also notes that her daughter's activity levels have increased without the previously associated symptoms. One month of treatment the patient is able to get off of her medications

completely and continues to be symptom free. She now only carries an Albuterol inhaler in case of and emergency.

Objectively, the patient's lung function tests also improved after chiropractic treatment. On measures of FVC (Forced vital capacity), FEV1 (Forced expiratory volume in 1 second), and FEV3 (Forced expiratory volume in 3 seconds) all measures were increased after 2 months of care. [12]

**The Types and Frequencies of Improved Nonmuskuloskeletal Symptoms Reported After Chiropractic Spinal Manipulative Therapy**

This data was retrospectively gained information from 87 Swedish Chiropractors about various symptoms and conditions. The information used to gauge a reaction or improvement was gained from pre and post-treatment questionnaires. Of the 1,504 valid questionnaires collected, none listed asthma or difficulty breathing as the primary reason for visiting their chiropractor. After three weeks of spinal manipulative therapies and soft tissue treatment, the patients were given another questionnaire and asked to describe any unexpected positive reactions they have noticed. There were 120 patients who noted that they noticed that their lung function has had a positive change since treatment began, 98 stated that it was easier to breathe and 6 stated that their asthma has gotten better. The study fails to state clearly what these patients were afflicted by previous to treatment and the number who did not see these positive results. It does, however, show that 25% of the patients, as a whole shown improvement in either respiratory function or digestive system function. [13]

**Quantifiable Effects of Osteopathic Manipulative Techniques on Patients with Chronic Asthma**

This report is slightly different than that of the previous reviewed articles, in that it the techniques utilized were Osteopathic rather than Chiropractic. Firstly, attempts are made to allow the thoracic spine and rib cage to move to the full ranges of motion they can. This includes the muscles of respiration. Second, the autonomic nervous system is addressed by restoring the normal motion to the thoracic and costal joints. Lastly, the OMT targets the lymphatic flow to and from the bronchial tree. The swelling known as edema builds up in the asthmatic and optimizing the flow can help clear a congested chest. The treatments themselves and methods in which they were delivered were similar enough to be included in this review.

The study comprised of 10 female patients aged 35-59 years old; each of them diagnosed with chronic asthma. They were monitored as they were treated with osteopathic manipulations. A peak expiratory flow rate and upper and lower thoracic excursion measurements were obtained 15 minutes before and after they received treatment. The data provided shows that the upper and lower thoracic excursions have increased significantly after one intervention in the patients, as has the peak expiratory flow. The patients also note that they felt an "ease of breathing" after the treatment. [14]

**Manual Therapy for Asthma**

From 473 unique citations, 68 full text articles were retrieved and evaluated, which resulted in nine citations to three RCTs (156 patients) suitable for inclusion. Trials could not be pooled statistically because studies that addressed similar interventions used

disparate patient groups or outcomes. The methodological quality of one of two trials examining chiropractic manipulation was good and neither trial found significant differences between chiropractic spinal manipulation and a sham maneuver on any of the outcomes measured. One small trial compared massage therapy with a relaxation control group and found significant differences in many of the lung function measures obtained. However, this trial had poor reporting characteristics and the data have yet to be confirmed. [15]

**Chronic Pediatric Asthma and Chiropractic Spinal Manipulation: A Prospective Clinical Series and Randomized Clinical Pilot Study**

This is a clinical pilot study conducted using 36 patients, aged 6 to 17 years old. Each patient had been medically diagnosed with mild and moderate persistent asthma. There were several forms of outcome measures used to track the patients progress, both objective and subjectively. Each patient had their AM and PM peak expiratory flow rates measured, each was to track the severity as well as asthma specific quality of life, and keep a diary of day and nighttime symptoms.

The treatment to each patient was 20 treatments over 3 months of either Chiropractic Spinal Manipulative Therapy (SMT) or sham SMT in addition to the standardized medical management they were receiving prior to this study. At the end of the 3-month period, the pulmonologist rated function of the lungs was statistically insignificant, while the patient rated quality of life scores and severity ratings improved by 10%-28% and 39% respectively. There was also a 20% decrease in bronchodilator use amongst the SMT group. These improvements were maintained at a 1-year follow up. This paper

suggests that further research is needed to delineate and isolate the specific methods and components that are responsible for the improvements in the patient oriented outcomes so that they may be incorporated into the care of all patients with asthma. [16]

**Chronic Asthma and Chiropractic spinal Manipulation: A Case Study**

This is a single case study of a 43-year-old female with a 5-year history of chronic asthma. She is a non-smoker and has no family history of asthma. She works as a part time aerobics instructor, where in the past few years she has had many exacerbations and attacks brought on by exercise. Her attacks are also brought on by foggy and damp weather conditions, as well as nightly dysponea, coughing and wheezing.

The treatment delivered to this patient was joint specific spinal manipulation of the facet joints of the lower cervical spine, upper thoracic, and costovertebral joints. She also received trigger point therapy and post-isometric relaxation techniques to hypertonic musculature. Within one month of beginning her treatment, she was able to cut her bronchodilator medication in half, and within 3 months she no longer used the medication at all, besides the sudden flair up, for which she used Ventolin. Over a 1-year period she has shown improvement with her peak expiratory flow measures from 430L/min to 550L/min. [17]

**Autism, Asthma, Irritable Bowel Syndrome, Strabismus, Illness Susceptibility: A Study in Chiropractic Management**

This case report was written after treating a 5-year-old female with multiple, organic, non-musculoskeletal complaints. The chief complaint of the parents was related to the child's autism and the temperamental nature associated with it. The parents also

felt there were other conditions that were not getting the attention the needed due to the severity of the autism, asthma and a series of recurring upper respiratory infections, irritable bowel, and strabismus to name a few.

The child would be in a state of upper respiratory illness or infection for 8-10 months of the year, 50% of which would require the use of an albuterol inhaler to deal with asthma attacks. If the inhaler was not enough, she would take a 5-day regimen of prednisone or be taken for an in-office nebulizer treatment.

The patient was then adjusted twice within the first week of care. Her mother stated after the first adjustment the child had her first good night of sleep she could remember, and that her mood and overall temper was improved. The second week of treatment she was adjusted once. Her mother states that this week showed continued improvement with sleep, temper, language skills, and she was more apt to be touched and make interpersonal contact. By the third week of care, the Dr. adjusted her once more. The mother notes that her temper had gone down considerably, and sleeping was no longer an ordeal at night or naps throughout the day. She went from several incidents a day of diarrhea to only 1-2 bowel movements a day, which she was able to recognize and use the toilet. The forth week of care, the Dr. determined that no adjustments were necessary. The patient's mother stated that she has maintained these tendencies and is no longer afflicted by a majority of the outbursts, she is almost fully resolved of her IBS, and has not had one upper respiratory ailment or asthma attack since treatment began. [18]

**Chiropractic co-management of medically treated asthma**

There are three cases presented in this DC's article. All three were patients were assessed and treated with high velocity, low amplitude Diversified adjustments twice a week over a 6-week period.

Case 1 is a 28-year-old male diagnosed with childhood asthma. His symptoms were most prevalent at night or exercise induced. At the beginning of care he reported using medications in the morning and night, and a separate inhaler as needed. After a few weeks into the trial, he stated that he forgot to use his inhaler one night before bed and suffered no ill effects. He stopped usage from this point on. At the end of the 6-week trial, the patient's peak flow measurements were increased and medication use decreased. The patient chose to continue his care after the study had been concluded.

Case 2 is a 56-year-old female diagnosed with a 5-year history of asthma. She was admitted to care for her chest tightness and coughing. After the first two weeks of treatment, she states that she feels "much better within herself" and that breathing was much easier with less coughing. This patient also noted some other non-musculoskeletal improvements since treatment began. She also continued care after this study was completed.

Case 3 is a 26-year-old female with a diagnosis of childhood asthma that is also exercise induced. This patient was a competitive rugby player and complained of several bouts of asthma that would stop her in the middle of a game where she would need to use her Ventolin inhaler. She reports nightly episodes of wheezing and being awoken by her symptoms that also required an inhaler. At the end of this trial, she was able to play entire games of rugby without the need of an inhaler as well as sleep uninterrupted throughout the night. [19]

## Conclusion

After a thorough review of the literature, an assessment of the efficacy of chiropractic care on the management and treatment of asthma can be made. In all of the case studies reviewed the patients were shown to have a decrease in symptoms and an increase in quality of life. As health practitioners it is our priority to offer patients an individualized treatment plan that best meets their specific needs. For the patients studied, incorporating chiropractic care into their current asthma treatment plan enabled them to decrease the frequency of the use and their reliability on their inhaler, while lessening the severity of their symptoms. Widening treatment options should be available to all asthmatic patients. Through collaboration with general practitioners and primary care physicians, chiropractors can offer asthmatic patients options that may not have otherwise been aware of this effective treatment option.

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