

Upper Cervical Management of 47 Successive Cases of Asthma

William C. Amalu, DC, DABCT, DIACT, FIACT

ABSTRACT

Each day 14 Americans die from asthma. It is the only chronic disease, besides AIDS and tuberculosis, with an increasing death rate. Since 1979, asthma death rates have increased 58 percent overall. The death rate among patients' 19 years and younger has increased by 78 percent. (1, 2)

Asthma has become the most common and costly illness in the U.S. An estimated 17 million Americans suffer from asthma at an annual cost of over \$13 billion. It is the most common chronic childhood disease, affecting more than one child in 20. It accounts for an annual loss of more than 10 million school days per year and more hospitalizations than any other childhood disease. Reports indicate that American children with asthma have reached epidemic proportions. (1, 2)

Non-musculoskeletal pathologies are commonly thought to be the exclusive realm of medical treatment and not part of the mainstay of chiropractic care. The clinical observations of 47 successive cases of asthma, along with the presentation of a case study, are reported. Improvement in these patients' symptomatic profiles was 87-100% subsequent to corrections of aberrant arthrokinematic function of the occipito-atlanto-axial complex. A relationship between biomechanical faults in the upper cervical spine and the manifestation of abnormal central neurophysiological processing is suggested as the genesis of this condition.

Key words: Asthma, Infrared Imaging, Upper Cervical Spine

INTRODUCTION

Asthma is defined as a chronic inflammatory disorder of the airways. In susceptible individuals, this inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness, and coughing, particularly at night or in the early morning. The disease is characterized by airway obstruction that is reversible (but not completely in some patients), airway inflammation, and airway hyperresponsiveness to a variety of environmental stimuli. The airway obstruction is due to a combination of factors that include smooth muscle spasm, mucosal edema, increased mucus secretion, cellular infiltration of the airway walls, and injury and desquamation of the airway epithelium. A family history of allergy or asthma can be elicited in 30-50% of asthmatics.

Approximately 50% of asthmatic children outgrow their condition when they reach adolescence. However, 50% of these patients find their asthma symptoms reappear when they reach their thirties or forties. (3-7)

Over the past decade, research on the pathophysiology of asthma has focused on the inflammatory cells and their mediators in the immune response, neurogenic mechanisms, and vascular abnormalities. Recent interest in neurogenic mechanisms has focused on neuropeptides released from sensory nerves by an axon reflex pathway. These peptides have vascular permeability, mucus secretagogue activity, bronchoconstrictor activity, and a bronchial vascular dilation effect. These sensory nerves also act on the pulmonary airways and their microvasculature contributing to the special kind of airway inflammation that is characteristic of asthma. (8-11)

Asthmatics are placed into one of four classifications: intermittent, mild persistent, moderate persistent, or severe persistent. This is based on the severity of their symptoms and objective respiratory testing measures such as spirometry, FVC, FEV1, FEF, PEF, and the use of personal peak flow meters. Intermittent asthma symptoms occur only when patients are exposed to certain triggers (i.e. pollen or tobacco smoke). Patients with mild persistent asthma have symptoms more than twice a week, but less than once a day. Those with moderate persistent asthma have daily symptoms. Patients with severe persistent asthma have continual symptoms and limited physical activity. Depending on the level of classification, respiratory function ranges from less than 60% to less than 80% of normal. (3-7)

The medical treatment of asthma may be conveniently considered as management of the acute attack and day-to-day therapy. Drug therapy focuses on the two main aspects of the disease: bronchospasm and inflammation. Sympathomimetic medications cause bronchial smooth muscle relaxation as their effects mimic those of the sympathetic nervous system. The inflammatory aspect is managed with corticosteroids. While systemic corticosteroids are considered exceptionally effective, they are reserved for more difficult episodes because of their potential for serious adverse effects. (3-7)

STUDY REPORT

Over a 7-year period, 47 cases of asthma were treated in an outpatient setting. Every case was followed for a minimum of 2 years to observe treatment effectiveness. The study group was comprised of 28 males and 19 females ranging from 7 to 42 years of age. Of the 47 cases, 32 patients ranged in the ages of 7 to 19 years.

All of the cases presented with an incoming medical diagnosis of asthma and corresponding classification level. The patients were monitored by their medical specialists for objective respiratory improvement and medication changes. A thorough initial history and physical examination was performed to corroborate the diagnosis. The chronicity of this condition ranged from 2 to 23 years. Patients with intermittent or

exercise induced asthma were excluded from this study due to the ease of treatment response in most cases. Of the 47 cases, 11 were classified as mild persistent, 28 as moderate persistent, and 8 as severe persistent. Each patient's progress was assessed on every office visit by rating the intensity of the symptoms along with the frequency of their acute medication usage.

Upon stabilizing the upper cervical spine (as determined by consistently presenting normal paraspinal infrared images – Figs. 8 & 9), objective improvement in all 47 asthmatic cases was 87-100%. The total time of treatment to reach this point ranged from 3 to 9 months with a mean treatment time of 16 weeks. The most common initial treatment frequency used was 3 times per week with tapering frequency after 4-8 weeks. Total treatment visits ranged from 14 to 44 with a mean of 26 office visits to stabilization. All 47 patients reported maintaining their improvements at 2 years or more of follow up. The sole treatment rendered consisted of corrections of aberrant arthrokinematic function of the occipito-atlanto-axial complex. The method of adjusting used was Applied Upper Cervical Biomechanics (International Upper Cervical Chiropractic Association).

CASE REPORT

From the 47 subjects in this study, a case of severe persistent asthma has been selected for this report. The patient's presenting symptomatology, treatment profile, and case outcome is representative of most of the patients in this classification group.

A 12-year-old male was referred to our clinic with the chief complaint of chronic severe persistent asthma. The onset of the patient's symptoms began around 2 years of age. By the age of 4 he was diagnosed as severe persistent. His mother noted that almost anything from dust to cold drafts could trigger an asthmatic attack.

At the onset of treatment the patient was using oral medication twice a day and three different inhalers four times per day each for a total of 24 inhalations per day. Even with this level of medication the patient experienced daily attacks, almost constant wheezing, and a persistent tight and heavy chest. The patient was unable to engage in any physical activities that demanded more than walking. The severity of his condition prompted emergency room treatment approximately 5 times per year. The patient's mother described countless hours of sleep lost each week due to her son's attacks. His medical specialist advised that if his condition persisted, by age 30 he would be diagnosed with chronic obstructed lung disease and would be confined to a wheelchair with oxygen by age 45. This dim prognosis, implying a significantly decreased life span, brought his mother to tears as she described her son's condition.

Upon examination, the patient presented with early chest barreling, a mildly increased respiratory rate, and persistent inspiratory and expiratory wheezing. His other vital signs, ear, nose, and throat examinations were unremarkable.

Orthopedic examination revealed significant palpatory hypertonicity and tenderness of the left C0-C4 paraspinal musculature. A 26% overall decrease in cervical active and passive ROMs was noted along with left paraspinal pain in 4 of 6 ranges. Cervical orthopedic tests were found positive for facet joint irritation. Six-axis palpatory spinal joint examination revealed biomechanical abnormalities in the cervical and thoracic spine. The remainder of the patient's orthopedic spinal evaluation was unremarkable.



Figure 1

Gross neurologic examination was also found to be unremarkable. A high-resolution digital paraspinal infrared imaging analysis (TyTron C-3000 Paraspinal IR Imaging System) was performed in accordance with thermographic protocol (12-14). A continuous paraspinal scan consisting of approximately 362 infrared samples was taken from the level of S1 to the occiput (Fig. 1).

The data was analyzed against established normal values and found to contain wide thermal asymmetries indicating autonomic neuropathophysiology (15-18) (Figs. 2 & 3).

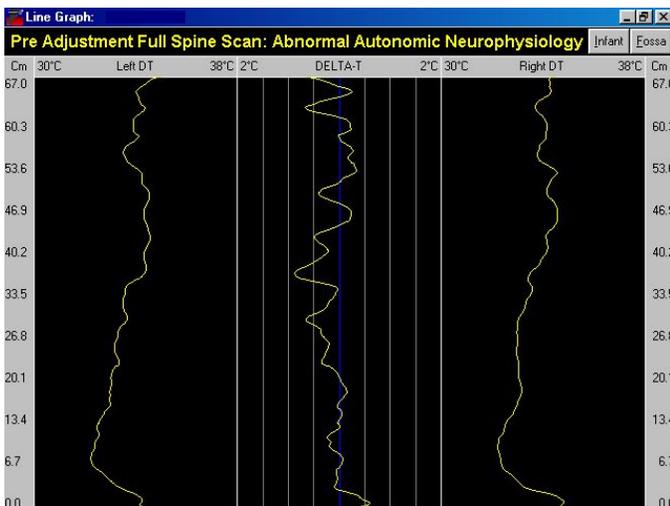


Figure 2

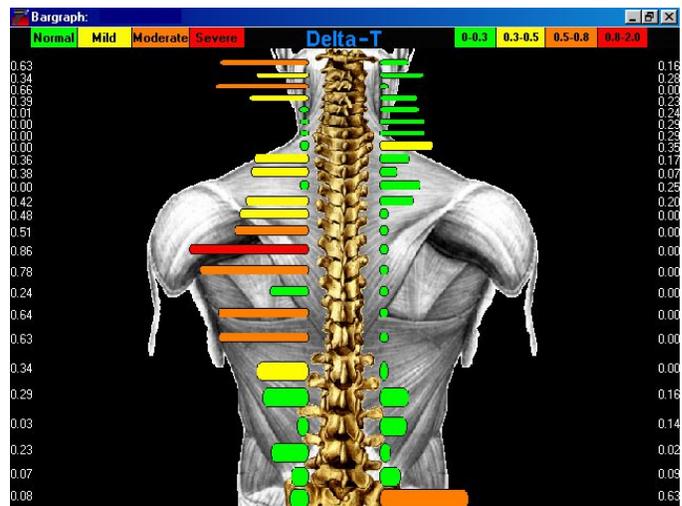


Figure 3

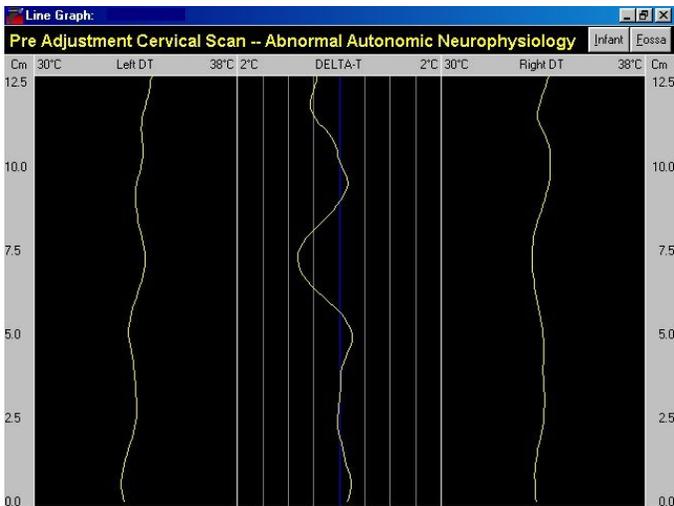


Figure 4

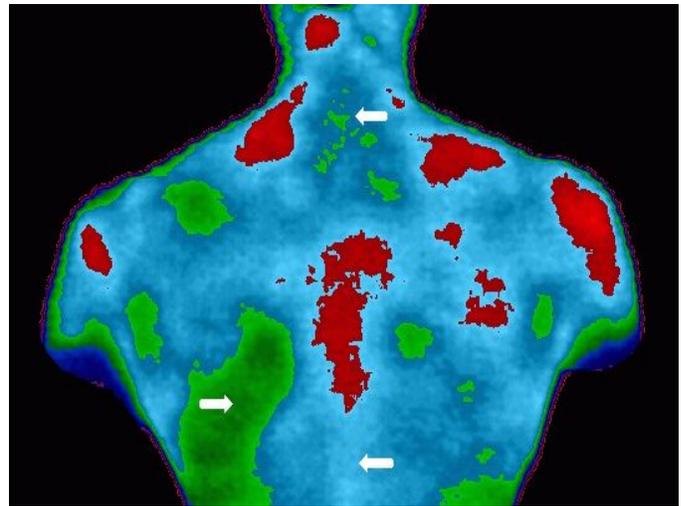


Figure 5

Since abnormal thermal emissions were noted in the cervical spine, a focused scan was performed with approximately 72 infrared samples taken from T1 to the occiput (Fig. 4). For the purpose of ruling out other pathologies, a digitized high-resolution infrared camera study (Inframetrics Forensic System 520) was also performed in accordance with accepted protocols (12-14). The scans included all surface aspects of the face, neck, upper extremities, and posterior thorax. The posterior thorax image showed disruption of the normal thermal gradient (Fig. 5), which is indicative of sympathetic dysfunction. As such, these findings are consistent with the clinical presentation of long-standing respiratory embarrassment.

The physical and infrared imaging examinations indicated abnormalities in the upper cervical spine. Consequently, a precision upper cervical radiographic series was performed for an accurate analysis of specific segmental biomechanics (19). Neutral lateral, AP, APOM, and BP films were taken using an on-patient laser-optic alignment system to precisely align the patient to the central ray.

A specialized method of radiographic analysis using mensuration and arthrokinematics was performed (19). Biomechanical dysfunction was noted at the atlanto-occipital and atlanto-axial articulations.

CHIROPRACTIC MANAGEMENT

Correction of the C1 segment was chosen first due to the accumulated degree of aberrant atlanto-occipital biomechanics. Before treatment was rendered, the patient and his parents were advised that exacerbations in symptomatology might occur as part of the normal response to neural reintegration.



Figure 6

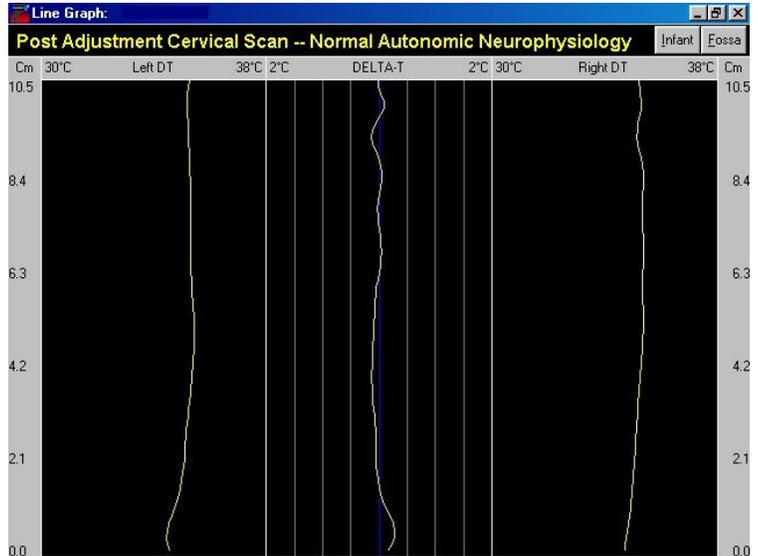


Figure 7

The patient was placed on a specially designed knee-chest table with the posterior arch of atlas as the contact point (Fig. 6). An adjusting force was introduced using a specialized upper cervical adjusting procedure (20). The patient was then placed in a post-adjustment recuperation suite for 15 minutes as per thermographic protocol (12-14). Correction of the subluxation was determined by resolution of the patient's presenting neuropathophysiology on the post-adjustment paraspinal scans (Fig. 7). All subsequent office visits included an initial cervical scan, and if care was rendered another scan was performed to determine if normal neurophysiology was restored (Figs. 4 & 7). Since care was focused in the upper cervical spine, only cervical paraspinal scans were taken during normal treatment visits with full spine scans performed at 30-day re-evaluation intervals.

The patient reported a noticeable reduction in his symptoms during the first two weeks of treatment. Wheezing, along with chest tightness and heaviness began to subside. His mother noticed an increase in the patient's activity levels without the usual increase in symptoms. She also reported that his inhaler use was also slightly decreased.

By the end of the fourth week of care, the patient had reduced his inhaler use from 24 to 4 times per day. The frequency of his attacks had diminished to one time per week at the most. The patient's mother couldn't believe the changes seen in her son. From an initial activity level of only walking, he was now participating in running sports.

A re-evaluation was performed at this time. The patient's mother noted an 85% overall improvement in his condition. The examination revealed significant improvement in all of his initial findings. A full spine paraspinal infrared scan was performed at this

time noting total resolution of the patient's presenting neuropathophysiology (Figs. 8 & 9).

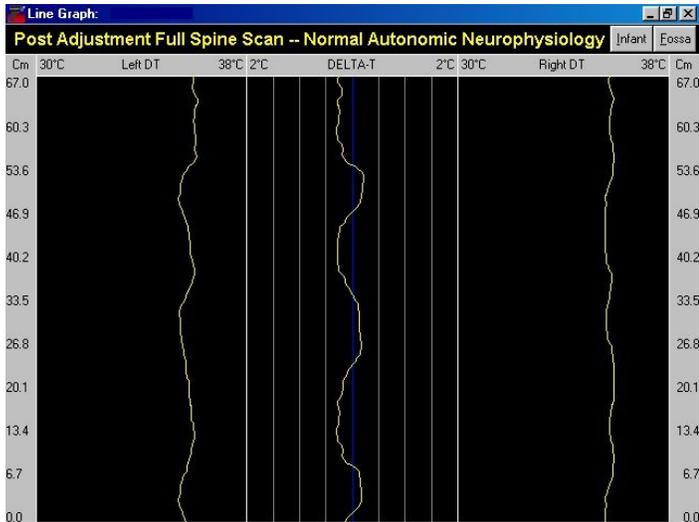


Figure 8

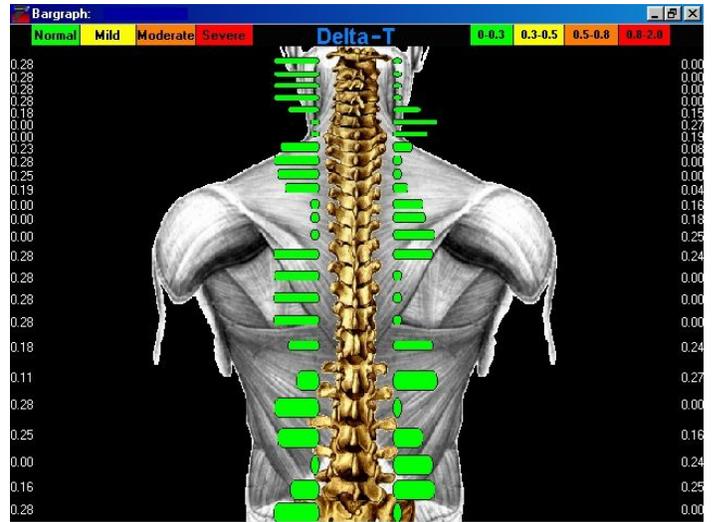


Figure 9

Continued improvement was seen through week six. The patient had been scheduled for a check up with his respiratory specialist in order to clear him for school sports. By this time, the patient was using his inhaler on an as needed basis of approximately 2 times per week. His medical examination revealed a significant improvement in respiratory function. The physician prescribed a 50% reduction in the patient's oral medication and cleared the patient for physical activities.

By the end of week eight, the patient was training for his school's 1-mile turkey trot. He was experiencing no asthma attacks, wheezing, or chest symptoms. His mother reported that the only time he used his inhaler was during and/or after his training. She also noted a 95% overall improvement in her son's condition. All of his initial examination findings had resolved. The frequency in which the patient was presenting with normal paraspinal infrared scans indicated that stabilization of the upper cervical joint complex was occurring. Consequently, a decrease in treatment frequency was made at this time.

Over the next four weeks the patient continued to improve. The only asthmatic symptom reported was mild chest tightness after running. Only one daily dose of oral medication was being used by this time. A digitized high-resolution infrared camera re-evaluation was performed with the images indicating a return of the thoracic thermal gradient and normalization of autonomic neurophysiology (Fig. 10). On the day of the turkey trot he not only finished without using his inhaler, but came in first place.

The patient continued to improve over the next two months. His medical check ups noted a steady improvement in respiratory function. Within 6 months from the onset of care, the patient was no longer using medication. Close to 1 year after initiating treatment, his mother called in tears to inform me that they had just returned from a

check up with his medical specialist. She reported that the specialist couldn't believe how much respiratory improvement had occurred and that the patient had been diagnosed as non-asthmatic.

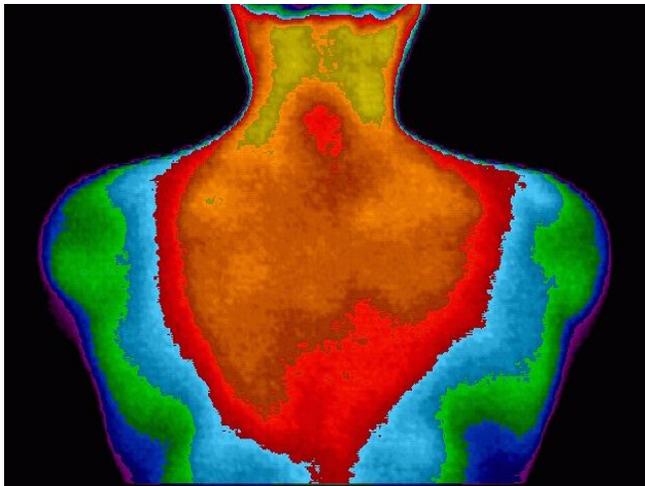


Figure 10

NEUROBIOLOGICAL MECHANISMS

The profound changes seen in these patients may be explained by two widely researched neurophysiologic mechanisms. The first is CNS facilitation (21-25). This condition arises from an initiating trauma (birth, falling, etc.) which causes entrapment of intra-articular meniscoids resulting in segmental hypomobility. Compensatory hypermobility causes hyperexcitation of intra and periarticular mechanoreceptors and nociceptors. With time, this bombardment of the CNS can cause facilitation. Facilitation is a conditioned exponential rise in afferent signals to the cord and/or brain. This may cause a loss of central neural integration due to direct excitation, or a lack of normal inhibition, of pathways or nuclei at the level of the cord, brainstem, and/or higher brain centers. Inherently poor biomechanical stability, combined with the greatest concentration of spinal mechanoreceptors, makes the upper cervical spine uniquely suited to this condition.

The second mechanism is cerebral penumbra or brain cell hibernation (26-32). Previous research held that the neuron existed in one of two basic states: function or dysfunction. However, a third state was discovered which may explain the rapid and profound changes seen in some patients. When a certain threshold of ischemia is reached, the neuronal state of hibernation occurs; the cell remains alive, but ceases to perform its designated duties. Entire functional areas of the brain may be affected. The mechanism of hyperafferency, as mentioned above, plays an initiating role. Hyperafferent stimulation of the central sympathetic regulating center in the brain may

cause differing levels of cerebral ischemia. A second route via the superior cervical sympathetic ganglia, may also cause higher center ischemia.

Since recent research has elucidated neurogenic mechanisms which cause bronchoconstriction, mucus secretion, and airway inflammation in asthmatics (8-11), normalization of neural function could correct the condition. In the treatment of asthma, sympathomimetic drugs are used to mimic the normal activity of the sympathetic system (3-7). Why not return function to this system rather than prescribing drugs that mimic it. Normalization of pathologic central sympathetic regulation due to cerebral penumbra, and/or direct pathophysiologic spinal pathway integration to the bronchial tree, may explain our effects.

The role that the sympathetic nervous system plays in the regulation of immune function is substantial (33-35). Dysregulation of this system could result in sympathetically mediated immune dysfunction and thus, airway inflammation and hyperresponsiveness. Correction of pathologic sympathetic regulation resulting from cerebral penumbra and/or facilitation could lead to a return of normal immune function.

CONCLUSION

The single most important factor in this study was our ability to objectively monitor the adjustment's affects on each patient's neurophysiology. Our profession uses many types of tests such as leg length, cervical challenge, motion and static palpation, and others. These procedures, however, lack objectivity, posses inherent errors, and have no literature confirmation of their ability to monitor neurophysiology (36-39). Infrared imaging has been researched for over 30 years compiling almost 9,000 index medicus studies confirming its use as an objective measure of neurophysiology. By using this technology, our center has been able to consistently determine the correct treatment procedures that produce reproducible and dramatic neurophysiologic improvements.

Since the core health principle of the chiropractic profession stands on the premise that homeostasis is dependent upon coordinated neurophysiology, then it becomes our responsibility to objectively monitor this system as an outcome measure. But not any form of neurologic testing will suffice. We need to monitor the autonomic nervous system if we are to detect changes in systemic neurophysiology. Paraspinal infrared imaging fulfills this need by objectively measuring the fine autonomic changes seen at the spinal level where messages are sent to effect deep visceral function.

To what magnitude the upper cervical spine is involved in the genesis of asthma remains to be seen. In an atmosphere where much of the public sees our profession as musculoskeletal treatment at most, patients with complex disorders are left unaware of the possible benefits of care. Further research into this area of the spine, combined with objective monitoring of neurophysiology, may reveal that chiropractic does indeed offer consistent conservative management of asthma.

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About The Author

William Amalu, DC is a board certified clinical thermographer who specializes in the upper cervical spine. He is also the vice president of the International Academy of Clinical Thermology and research director for the International Upper Cervical Chiropractic Association. Inquiries should be directed to him at the Pacific Chiropractic and Research Center (650) 361-8908.

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