

# Correct **B**reathing



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Taking steps to improve a child's breathing can also improve their sleep, mood, behaviour, ability to pay attention, eliminate bedwetting, decrease their needs for asthma medication and reduce the incidence of colds and ear infections.

by Dr. Rosalba Courtney N.D. D.O. PhD



**B**reathing much like food and love is fundamental to life and to children's health. To optimise a child's health, facial attractiveness and development we need to ensure that their airways are not obstructed and that they have good breathing.

The modern epidemics of chronic non-communicable illnesses plaguing our children, such as asthma, allergy, sleep apnea, ADHD, depression, anxiety, crooked teeth and orthodontic problems have complex causes many of which arise from the dietary and environmental changes of our times. However, they are also strongly connected to aspects of breathing, many of which can be improved.

Many people are unaware that taking steps to improve a child's breathing can also improve their sleep, mood, behaviour, ability to pay attention, eliminate bed-wetting, decrease their needs for asthma medication and reduce the incidence of colds and ear infections.

Also, ensuring that a child breathes through their nose is a key to the develop-

ment of an attractive face with plenty of space for all the teeth and proper alignment of the upper and lower jaws.

"Many cases like Josh's exist. Josh was an irritable baby who did not sleep well. As he grew older he suffered from many colds, ear infections and croup. By the age of 5 Josh was diagnosed with asthma. He was a frequent mouth breather who snored at night and frequently wet the bed.

At school the teacher said that he was a delightful child in many ways but always fidgeting and fooling around, unable to settle down to do his work and disruptive to the rest of the class. At the age of 8 Josh was still wetting the bed most nights, needing asthma medication daily and had been prescribed Ritalin for ADD.

Josh's mother searching for natural approaches to improve his health had taken steps to mostly eliminate dairy, sugar, processed food and wheat from his diet. These had improved Josh's health but he still breathed through his mouth, wheezed if he did not take his asthma medication daily, was easily upset, distractible and frequently tired.

Josh's dentist recommended he learn to stop mouth breathing to help his facial development and because it might also help his asthma. He was referred for breathing therapy and after doing his breathing exercises daily for 2 weeks he was sleeping much better at night, and had gone 5 nights straight without wetting the bed, his needs for asthma medication had reduced and his mother reported that he was much calmer and seeming happier in himself.

Josh still found it hard to breath through his nose all the time and because his tonsils were still very large he was referred to an ear, nose and throat specialist who recommended that his tonsils be remove. A year later Josh was a different child and the majority of his health problems were resolved" from "The importance of correct breathing for raising

healthy good looking children". Journal of the Australian Traditional Medicine Society, 19 , 20-26. (Courtney, 2013)

### Signs of Poor Breathing in Children

The signs that a child has poor breathing are obvious when we are aware of what to look for however they are often overlooked by parents and health practitioners and their importance is not sufficiently appreciated.

One of the most important signs that a child has obstructed airways or breathing dysfunction is mouth breathing. Other signs include snoring, exaggerated upper chest breathing, frequent sigh-

ing, poor sleep, bed wetting and teeth grinding.

Children with obstructed breathing tend to be pale with dark circles under their eyes. In these children oxygen and carbon dioxide levels can tend to be abnormal.

Some children with disordered breathing hyperventilate (which causes them to have low carbon dioxide and normal blood oxygen but low tissue oxygen) and others hypoventilate (which causes them to have high carbon dioxide levels and low blood and tissue oxygen).

### Sleep Breathing Disorders and Your Child's Brain and Nervous System

Many research studies over the last decade have shown that children (and babies) who mouth breathe, snore and have sleep apnea have an increased incidence of learning and behavioural difficulties and show signs of delayed intellectual development, poor impulse control and hyperactivity.

One of the most important signs that a child has obstructed airways or breathing dysfunction is mouth breathing.

One of the most recent studies followed 11,000 British children for six years, starting when they were 6 months old (Bonuck et al., 2012). The children whose sleep was affected by breathing problems like snoring, mouth breathing or sleep apnea were 40 to 100% more likely than normal breathers to develop ADHD.

Children with the most severe and most

persistent sleep-disordered breathing had the worst behaviour and cognitive function. This research like other research before it was also able to show that cognitive and attention-directed tasks and behavioural issues greatly improved when the airway size was improved by removal of adenoids and tonsils.

In many cases children diagnosed with ADHD before the surgery no longer fit the criteria after it.

Why is this? This is thought to be due to the fact

that disturbed sleep patterns and lack of oxygen prevent the brain developing as it should. Also research shows that frequent arousals at night eventually lead to imbalances in the autonomic nervous system so that the fight/flight or aroused state of the sympathetic nervous system persists in the day (Narkiewicz and Somers, 1997).

Normal restorative sleep has many stages. In the deeper levels of sleep the muscles to the airway lose their normal tone. If the child's airway is already compromised because of postural, structural abnormalities, enlarged adenoids or tonsils or a chronically blocked nose their airway can become obstructed and instead of staying in the deep sleep that children's brains need for rest and proper development their nervous system becomes aroused.

This can happen repeatedly and frequently at night. In severe cases this is called sleep apnea. However many more children snore and have some degree of what is known as upper airways resistance syndrome (Kennedy and Waters, 2005).

Parents should be alerted that there may be a sleep breathing disorder if a child breathes noisily at night, snores, sleeps with their mouth open (particularly with the head thrown back), has restless sleep, wakes frequently at night, wets the bed, grinds their teeth at night, has difficulty going to sleep, has night terrors or bad dreams.

### Breathing Posture and Structural Development

Good health is associated with a wide face, broad palate with plenty of room for all the teeth, facial symmetry and good posture.

This was

the conclusion made by Dr. Weston Price, after 13 years of travelling the world during the 1930's and 40's examining and photographing members of traditional societies who beauty and superb physical health is documented in his book "Nutrition and Physical Degeneration".

Dr. Price also observed that within one generation of eating processed food such as white flour and white sugar, the beautiful facial structure and balanced symmetrical posture common to most of these people changed.

Their faces became narrower and more asymmetrical, teeth once straight "as piano keys" became



crooked and jaws became unbalanced. Pivotal to the change in facial structure seen by Dr. Price is airway obstruction and the subsequent change in breathing from predominately nasal breathing to mouth breathing.

Anthropologists who have been studying skulls tell us that the change in human facial structure towards a narrower and less functional shape began with the dawn of agriculture, increased after the industrial revolution but that the most radical changes have been since the 19th century. They confirm Dr. Price's observation that malocclusion is rare or non-

sits low in their mouth and the normal pressures needed to develop the width of the upper palate are reduced or abnormal.

If tongue position is incorrect, swallowing pattern also tends to become abnormal. Normally every time we swallow, (1-2 times per minute) the tongue pushes upwards into the palate and then backwards to complete the swallow. When a predominately mouth breathing child swallows the tongue tends to thrust forward and the lower jaw tends to move backwards. This creates forces that distort the position of

existent in hunter gatherer societies and in many traditional agricultural societies.

The changes in facial structure occurring in modern humans have a lot to do with breathing habits during the early years of a child's growth and development. A child who has a blocked nose or who has a perceived or real difficulty getting enough air will begin breathing through their mouth rather than through their nose. Tongue position and swallowing patterns change as a result of this and the forces that normally shape facial and dental development become aberrant. The tongue of a mouth breathing child

the teeth and works against the natural forces which determine proper facial growth.

Posture, especially of the head and neck is also very much influenced by a child's breathing. It has long been recognized that blocked or obstructed airways, at the nose or throat or bronchi, will make a person tilt their head back to increase the size of the airway.

If this response becomes habitual the person develops fixed postural abnormalities, such as forward head posture. This is known to be associated with neck pain, back pain, headaches

and temporal-mandibular joint (TMJ) syndrome. A child who is not getting enough air or who has become habituated to over-breathing or straining for air will frequently show a forward head posture and tight neck and shoulder muscles. Their diaphragm function tends to change and this affects the development of the rib cage and postural patterns in general.

### Effects of Breathing on the Immune System

The nose normally acts as a filter and participates in the immune response against virus, bacteria and fungi. Chemical substances produced in the nose such as nitric oxide and lysozyme break down pathogens such as bacteria, virus and fungi in the nasal and oral mucosa. Mouth breathing reduces the availability of these substances thus compromising the child's immune defence system.

Children who breathe through their mouth are more prone to oral dysbiosis or growth of abnormal bacteria in the mouth and throat. This is a well known cause of increased tooth decay and gum disease and probably also

contributes to ongoing enlargement of adenoids and tonsils and ear infections. It may also contribute to abnormal gut flora. Many parents report that when their child stops mouth breathing they have less cold's and upper respiratory tract infections and that enlarged lymph glands become smaller.

### Effects of Breathing on Oxygen, CO2 and pH.

The nose is one of the main places that nitric oxide is made in the body. Decreased nitric oxide due to mouth breathing has the potential to disrupt health in a number of ways.

The paranasal sinuses produce 60% of the body's nitric oxide. This particular substance is involved in over 2,000 reactions in the body. Nitric oxide is important for facilitating good blood flow and tissue oxygenation. Research has shown that nasal breathing can provide up to 10% more oxygen than mouth breathing (Lundberg et al., 1995).

Nitric oxide also helps to dilate bronchi and blood vessels and functions as a neurotransmitter that modulates memory and learning. It is possible that children who mouth breath may end up with lower oxygen and less blood flow to the brain other body tissues because of this habit.

Children with obstructed airways and breathing dys-

function can either overbreathe (which is called hyperventilation) to compensate for the obstruction or they may underbreathe (which is called hypoventilation) as a result of the obstruction and have insufficient oxygen and too much CO2 (called hypoventilation).

Sometimes they cycle between these two states, particularly at night if they have sleep apnea or sleep disordered breathing. A child who is hyperventilating does not necessarily have higher levels of oxygen. In fact it is well known that low carbon dioxide levels can actually impair O2 delivery to the brain and other organs.

Chronically low levels of CO2 also affect the body's ability to balance pH and in the long term children can end up with low bicarbonate levels and some degree of acidosis.

### Effects of breathing on asthma and allergy

Abnormal breathing patterns such as hyperventilation, mouth breathing and upper chest breathing can worsen asthma

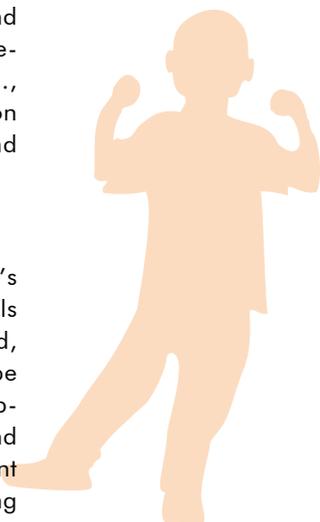
symptoms.

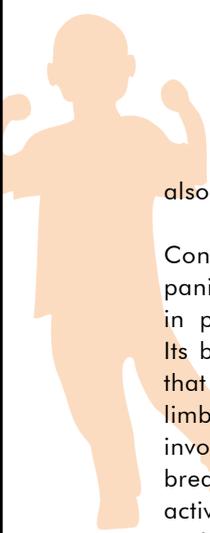
They make a child more likely to experience disproportionate breathlessness, anxiety about their symptoms and to lose control of breathing in ways that affect asthma control and increase medication use.

In many cases teaching a child to correct bad breathing habits and to control their breathing can be the first step in helping them manage and control over their asthma symptoms. Some research has shown that improving nasal breathing can reduce the severity of asthma (Peterson and Theman, 1996). Improving breathing pattern reduces feelings of breathlessness (Courtney et al., 2011). Normalising excessive hyperventilation tendencies can make the airways less reactive and prone to spasm (Laffey, 2003).

### Breathing Emotions and Stress

Many parents have reported that when a child's breathing improves or after adenoids or tonsils are removed they seem like a different child, calmer, less irritable and happier. This can be because they are getting a better oxygen supply. It may also be partly due to neurological and psychophysiological effects of breathing. Recent research using brain scans shows that breathing sensations are processed in parts of the brain that





also process emotions.

Conditions such as anxiety, depression and panic disorder are as much as 4 times higher in people with asthma(Lehrer et al., 2002). Its believed that asthma and other conditions that affect airflow influence the function of the limbic system and adjacent parts of the brain involved in emotional processing, and that breathing disturbance contributes to anxiety by activating the brains fear network (Rosenkranz and Davidson, 2009).

Breathing is a major influence on mind-body interaction. It has long been know that attention to breathing can train mental focus, calm stress and promote positive emotional states. Focused attention on the breath is the foundation of most meditation, mindfulness and relaxation techniques and is a means for getting in touch with our deeper selves.

Children can also be trained to use breathing modulation for emotional self-regulation. Children with health and behaviour issues can have poor perception of body sensations. Learning to feel and modify breathing can be one of the most effective ways to

help children become grounded and connected to their bodies in general. Increased sensitivity to their felt senses can help them to recognize and therefore regulate emotions.

### What can be done to improve a child's breathing?

The solution to a child's breathing problems often needs to be multi-layered combining diet, breathing exercises, dental work and sometimes medication and removal of adenoids and tonsils. Correcting gut and immune function through increasing probiotic and lactofermented foods, reducing processed foods and providing good quality nutrient dense food diet is fundamental. As the function of the immune system improves the lymphoid tissue in the upper airways reduces in size and breathing can subsequently also improve.

Children can also be taught breathing exercises to improve their breathing. Breathing heals in many ways and working with a practitioner who understands breathing therapy can be

very helpful. One technique which has become well known particularly for teaching children to stop mouth breathing is the Buteyko method. This method can be helpful for asthma and mouth breathing.

Buteyko practitioners sometime make the assumption that all mouth breathing or asthmatic children are hyperventilating and this is not always the case. Its best to work with a Buteyko practitioner or other breathing therapy specialist that assesses a child's breathing and treats the child according to their individual needs and preferably takes a holistic approach referring to other health professionals when necessary.

## Teaching a child to correct bad breathing habits and to control their breathing can be the first step in helping them manage and control over their asthma symptoms.

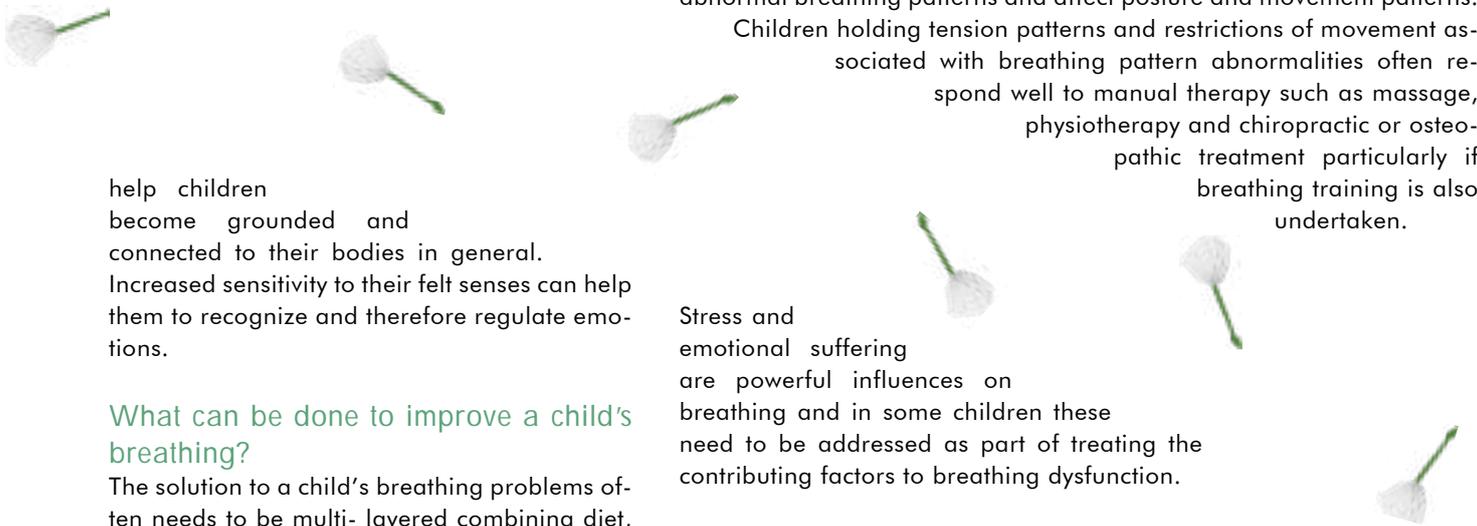
Some children with very large adenoids and tonsils cannot stop mouth breathing unless these are removed. While natural non-surgical means are always preferable some children with severe obstruction of their airways do need to have their adenoids and tonsils removed to make enough space for breathing. If the jaw is narrow a dentist or orthodontist can be consulted regarding widening the palate or increasing the height of the back teeth to make more room for breathing.

Breathing dysfunction leads to muscular-skeletal changes that re-inforce abnormal breathing patterns and affect posture and movement patterns.

Children holding tension patterns and restrictions of movement associated with breathing pattern abnormalities often respond well to manual therapy such as massage, physiotherapy and chiropractic or osteopathic treatment particularly if breathing training is also undertaken.

Stress and emotional suffering are powerful influences on breathing and in some children these need to be addressed as part of treating the contributing factors to breathing dysfunction.

How a child breathes is a reflection of their health and the myriad of factors that influence it. By observing how a child breathes we can glean important information about their current state of health and we can also make predictions about their future health and facial development. When we improve a child's breathing dysfunctions, by working directly with breathing or by addressing its causes, we remove an important obstacle to health and to the development of their facial attractiveness as teens and adults.



## More information-

Buteyko techniques for Stopping Mouth Breathing in Children- Free Video and Instructions

<http://www.breathandbody.com.au/stop-mouth-breathing/>

Healthy Breathing Healthy Child Program

<http://www.breathandbody.com.au/healthy-breathing-healthy-chil/>

## References

BONUICK, K., FREEMAN, K., CHERVIN, R. D. & XU, L. 2012. Sleep-disordered breathing in a population based cohort: behavioural outcomes at 4 and 7 years. *Pediatrics*, 129, 1-9.

COURTNEY, R. C. 2013. The importance of correct breathing for raising healthy good looking children. *Journal of the Australian Traditional Medicine Society*, 19, 20-26.

COURTNEY, R. C., GREENWOOD, K. M., DIXHOORN, J. & ANTHONISSEN, E. 2011. Medically unexplained dyspnea partly moderated by dysfunctional (thoracic dominant) breathing pattern. *Journal of Asthma*, 48, 259-265.

KENNEDY, D. & WATERS, K. 2005. Investigation and treatment of upper-airway obstruction: childhood sleep disorders *Med J Aust*, 182, 419-423.

LAFHEY, J. 2003. Carbon dioxide attenuates pulmonary impairment resulting from hyperventilation. *Critical Care Medicine*, 31, 2634-40.

LEHRER, P., FELDMAN, J., GIARDINO, N. D., SONG, S. H. & SCHMALING, K. 2002. Psychological aspects of asthma. *Journal of Consulting and Clinical Psychology*, 70, 691-711.

LUNDBERG, J. O., FARKAS-SZALLASI T., WEITZBERGER, E., RINDER, J., LIDHOLM, J., ANGGAARD, A., HOKFELT, T., LUNDBERG, J. M. & ALVING, K. 1995. High Nitric oxide production in human paranasal sinuses. *Nat. Med.*, 1, 370-3.

NARKIEWICZ, K. & SOMERS, V. K. 1997. The sympathetic nervous system and obstructive sleep apnea: implications for hypertension. *J Hypertens*, 15, 1613-1619.

PETRUSSON, B. & THEMAN, K. 1996. Reduced nocturnal asthma by improving nasal breathing. *Acta Otolaryngol*, 116, 490-492.

ROSENKRANZ, M. A. & DAVIDSON, R. J. 2009. Affective neural circuitry and mind-body influences in asthma. *Neuroimage*, 47, 972-80.