

# Aromatherapy Times

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## Physiological Efficiency and Posture

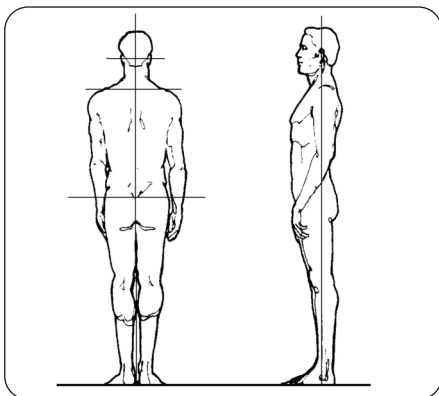
by Sue Wellar

How can poor posture affect the autonomic nerve supply, biochemistry and organ function? How can correcting the posture bring the body back to a state of harmony?

The ideal upright posture is the one which uses the least amount of energy to maintain us in an upright position within the Earth's gravitational field. You probably see it in your practice rooms every day; not in your clients or even, dare I say, colleagues, but on the anatomical charts you have on the wall.

When we exhibit this ideal posture we can function in a physiological efficient way, the autonomic nervous system and biochemistry function optimally and organs are in balance with each other.

The term used to describe this ideal posture is the Physiological Efficient Posture, or the PEP, for short. Posture can be simply assessed using a decorator's plumb bob. From the posterior view, the plumb line bisects the body equally left to right and the shoulders, hips and occiput are level and parallel. From the lateral view the plumb line would pass through the middle of the ear (external auditory meatus), shoulder (sulcus intertubercular of the humerus), hip (greater trochanter of the femur), knee (anterior proximal tibiofibular joint) and ankle (talocalcaneal sulcus) and the spinal curves would be smooth and normal.



The Physiological Efficient Posture

The PEP is dependent on two areas of the body being in balance with each other. Just like any other structure we need our body's centre of gravity to be in balance with its counterweight and in the upright person these points are the junction of the fifth lumbar vertebra and the first sacral segment (L5/S1) and the third sacral segment (S3)

respectively. We refer to this relationship as the Primary Alignment.



The Primary Alignment

If these two points are correctly aligned, then the body can hold itself upright, against the pull of gravity, with ease and poise using the least amount of energy possible, i.e. the PEP.

This led Ida Rolf, the founder of Rolfing, to state: "The balanced body does not experience weight due to gravity".

If, however, the body's centre of gravity is not correctly aligned with the counterweight then the body has to expend energy to hold itself upright. As soon as the Primary Alignment is lost, to whatever degree, the postural muscles begin trying to correct it. With enough rest we would be self-adjusting and the Primary Alignment would be restored, returning everything to a state of balance. When this is the case the body is said to be working within its elastic limits.

If this state of imbalance remains then the body goes beyond the elastic limit and enters a state of strain. It then becomes very difficult for the PEP to be restored. Over time more and more postural muscles are recruited as the body strives to re-establish the PEP, leading to further distortion. The body is said to have entered a "strain-distortion-strain cycle".

This cycle becomes apparent when assessing the posture at the plumb line, the string can land to the left or right of the midline, there is usually an anterior hip, laterally a forward lean and possible change to the anatomical curves are visible. If left the distortions become increasingly

noticeable, leading to physiological adaptations.

Within the autonomic nervous system disturbances to the PEP are viewed as noxious stimuli. The posture is monitored by the messages received in the brain from the various receptors within the joints and postural muscles, and from sensory input from vision and the vestibular system.

Here we are particularly interested in how the receptors in the joints respond. There are two main receptors within the joints, proprioceptors and nociceptors, which send messages to the brain about the relative positions of neighbouring parts of the body.

The brain integrates the messages from the proprioceptors and the vestibular system to determine its position within the gravitational field, in other words the posture.

The nociceptors within the joints detect negative stimuli, such as mechanical changes beyond a certain threshold or changes to the posture. These negative messages within the brain fire off the stress response via the hypothalamus and pituitary gland stimulating the adrenal glands. Nociception also stimulates the sympathetic part of the autonomic nervous system. This can continue for 24 hours a day.

Sadly, when we are in this state of heightened sympathetic response, we are unable to bring ourselves back to a state of internal balance as the parasympathetic nervous system is constantly being overridden. Remember the parasympathetic nervous system is responsible for the repair and maintenance of the body's internal environment.

Hans Selye, the Canadian endocrinologist who is regarded as the grandfather of the stress response model, explained that when we are in a constant state of high sympathetic tone we cannot maintain homeostasis and we adapt to this situation by altering the internal parameters and enter a state of allostasis. Within the stress response this is known as the resistance phase. Allostasis allows us to have some internal stability through changeable variables. It is essential in order to maintain

internal viability. However, this is at a cost because the parameters are higher or lower than when we are in a homeostatic balance. This cost to the body is known as the allostatic load.

Over time this constant allostatic load leads to changes to the pH of the internal environment. It becomes slightly more acidic, a condition known as acidosis. There is a rise in blood sugar as the demand for energy is constantly higher than when we are in homeostasis. There is an increase in nitrogen excretion, as we use up more of our protein stores, and with the increasing demand for minerals we can have salt and water retention. These are just some of the biochemical imbalances that can be measured.

When we examine the posture of people who are in the resistance phase of the stress response we begin to see more obvious postural distortion patterns arising. If left these progress and can lead to pain, disease and exhaustion.

These postural changes are not necessarily age related. They can be seen in the young amongst us, especially if they have had to deal with a number of stressors throughout their lives.

Stressors may include: physical ones such as trauma, over work, accidents and medical operations; emotional ones such as divorce, the loss of a loved one, abuse, bullying and moving house; biochemical ones such as the lack of a vitamin or mineral, poor protein intake, dehydration, too much salt and sugar; and spiritual ones such as a lack of purpose in life. I am sure you can up with a whole host of other stressors.

One we haven't mentioned here, but the one that puts the largest strain on the body when the posture is distorted, is gravity.

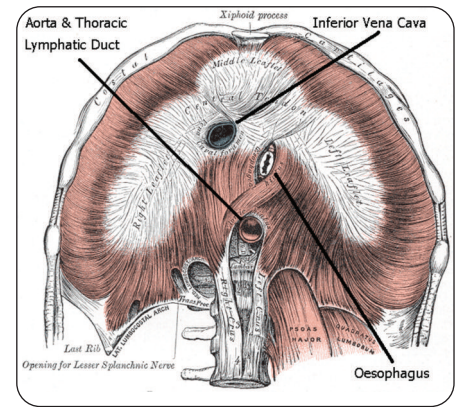
Postural distortion patterns also affect the geometrical relationship of the organs to each other. All of the organs have an optimal position relative to each other so that they can relate to each other via the circulatory system and the nervous system in a balanced way. In order for organs to be in their optimal geometrical space they require the body to be in the PEP.

When the posture adapts to changes at the centre of gravity the postural muscles are immediately and continuously engaged in trying to correct this change. Over time other postural muscles are recruited into the pattern and eventually we have chronically contracted and lax muscles which allow the joints of the body to become misaligned relative to each other and to the gravitational field.

For example in the forward head posture we can see that there is a hyperlordotic cervical spine. This blocks the action of the hyoid muscles, especially the inferior hyoid which helps to lift the first rib during inhalation. According to the work of Rene Cailliet M.D., the famous medical author and former director of the department of physical medicine and rehabilitation at the University of Southern California, a forward head posture can reduce vital lung capacity by up to 30%.

A persistent forward head posture puts a compressive load on the upper thoracic vertebrae, which can lead to an upper thoracic hump. This is found again in all age groups and is becoming more prominent with the increasing use of modern technology. The hump can adversely affect the heart, lungs and thyroid gland and has been linked to increased risk of death due to heart disease.<sup>1</sup>

Carrying on down the body, an extenuated thoracic curve, or kyphosis, can lead to the compression of the lungs and diaphragm again reducing the vital capacity of the lungs,



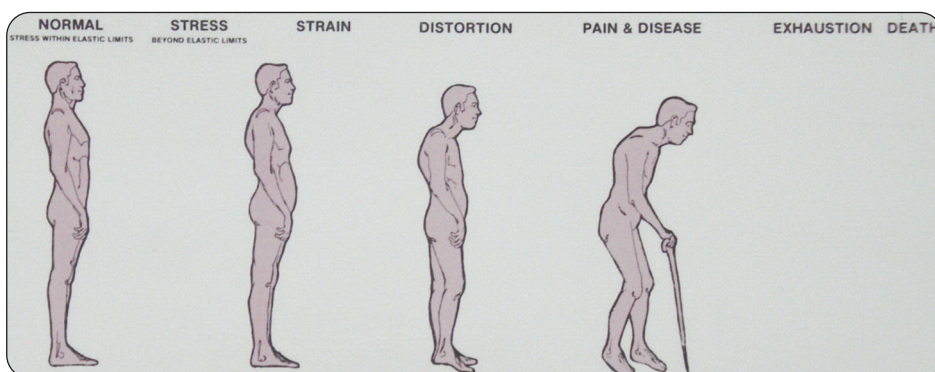
The Diaphragm

plus compressing the three openings in the diaphragm through which four important structures pass: the oesophagus, aorta, inferior vena cava and the thoracic lymphatic duct. Compression of the diaphragm can lead to a number of disturbances including, hiatus hernia, swellings in the legs and feet, congestion in the organs of the abdomen and pelvis. Chronic passive venous congestion, owing to the inferior vena cava not being "milked" superiorly on each inhalation, may contribute to varicose veins, haemorrhoids, and constipation. On top of all this a slumping forward and compression of the diaphragm can lead to visceroptosis or prolapse of the abdominal viscera.

### What can we do to improve the posture?

Using Ishta Spinal Touch, we are able to assess and measure the degree of postural distortion and determine a neuromuscular holding point that can restore the Primary Alignment. Over a course of alignments this allows the postural muscles to release their holding pattern encouraging the restoration of the Primary Alignment. The muscles can return to their more normal tone and the fascia can unwind, allowing the organs to re-orientate themselves. The autonomic nervous system can switch to the parasympathetic tone, so repair and maintenance can resume, reducing the allostatic load. Both of the above reduce the biochemical demands on the system. Obviously this takes time and education of the recipient. The overall aim is to reduce the stressor load on the body in the simplest most effective way possible.

*For more information on Ishta Spinal Touch please go to [www.ishtaspinaltouch.com/PEP.html](http://www.ishtaspinaltouch.com/PEP.html)  
1. Kado DM, Huang MH, Karlamanga AS, Barrett-Connor, Greendale GA  
Hyperkyphotic posture predicts mortality in older community-dwelling men and women: a prospective study. 2004 Oct; 52(10):1662-7.*



The Stress Sequence