

The Physio Chair – New Ergonomics or Just Applied Old Ergonomics?

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The concept of the Physio Chair is relatively simple:

1. Support the whole back not just the lumbar spine.
2. Encourage and support a slightly reclined posture to allow back and shoulder muscle activity to be moderate rather than overactive and fatigue prone.
3. Provide an upper backrest shape that encourages thoracic elevation and healthy, relaxed scapular position.
4. Provide a 3 lever fully ergonomic chair with an excellent deep foam seat that feels remarkably comfortable from the first time the user sits on it.



In some ways the Physio Chair is a critique of the standard 20th Century ergonomic office chair. Firstly, ergonomic office chairs to date have focussed predominantly on lumbar spine support to the exclusion of upper back support, shoulder blade position and neck strain issues. The Physio Chair backrest shape is narrow at the bottom and broad at the top – this mimics the typical human torso shape; narrower at the waist and broader at the shoulders. Hence the backrest feels like it “fits” when most people sit back against it.



Regular ergonomic chair backrest: wide at the waist; narrow at shoulders; lumbar support focus.

Secondly, ergonomic chairs to date have been developed around the concept of an upright posture being the most healthy spinal position – regardless of the relationship between hip flexion, pelvic rotation and spinal lordosis. This 90:90 posture has been ergonomic orthodoxy in all major western OH&S literature for at least the past 30 years. It has been so in-grained into most office workers such that it now goes unquestioned in many OH&S circles. Yet one of the key figures in modern ergonomics, Etienne Grandjean has repeatedly published the benefits of a semi-reclined work posture since the mid 1980's in several editions of his seminal work “Ergonomics: Fitting the Task to the Human”. And several studies have shown less lumbar disc pressure and less tension in back muscle with a semi-reclined posture.



Physio backrest: wide at the shoulders; narrow at waist; shoulder blade and whole back support focus

Proponents of the kneeling chair and the saddle seat have also made significant efforts to educate the public and OH&S profession that the hip/pelvis/lumbar relationship is critical to understand when considering seated desk-work postures.

My proposition regarding this relationship is that an open hip angle (i.e. greater than 90°, such as 100° or 110°) allows reduced lumbar disc pressure and a more relaxed musculature around the hip/pelvis/lumbar complex. One way to achieve this is through a vertical spinal posture and a downward angle of the femur – such as achieved by a kneeling chair and a saddle seat. The other way is through a reclined back posture and horizontal (or near horizontal) femur angle; such postures are achieved by chairs such as the Herman Miller Aero chair, a recliner and the Physio Chair.



Classic 90:90 posture: back or shoulders cannot “rest” on the backrest; at 110° the back and shoulders can relax



The Physio Chair – New Ergonomics or Just Applied Old Ergonomics? (cont.)

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We have designed the Physio Chair to appear highly recognisable as a standard ergonomic chair; but it's primary benefit appears when it is used in a semi-reclined posture, reclining the back at 100° or 110°, with the seat horizontal or slightly negatively tilted to hold the user into the supported reclined position.

It is remarkable to hear people say how natural it feels yet they are not used to sitting at a desk or computer this way – so indoctrinated have we been. Many users have remarked that their shoulder or neck soreness subsides when using the semi-reclined posture (along with keeping their arms near their sides by having the keyboard and mouse close to them).

This relief appears to be caused by two particular muscle areas being taken off strain. All the neck extensors, and particularly Levator Scapulae (through reversed origin action), are allowed to relax when the neck position is placed behind the midline – to view the computer screen the neck flexors are activated to hold the neck forward rather than the neck extensors holding the neck up (as occurs in upright and forward/protracted postures). In addition the scapular stabilisers (Rhomboids and middle/lower Trapezius) are able to relax when the upper thoracic spine is lifted and the shoulder blades are relaxed in a retracted posture rather than being on tension while the upper back is forward or upright and holding the arms and back against gravity.

Hence my statement at the start of this article: the concept of the Physio Chair is relatively simple. There is no rocket science here – if we relax muscles then fatigue pain subsides as circulation is restored and waste products such as lactic acid are flushed away; and if we position the spine with an open hip angle and provide reclined support rather than vertical loading, then lumbar disc pressure is reduced. As a result users are highly likely to feel more comfortable when supported well in a semi-reclined working posture – this is what the Physio Chair is designed to provide.



If readers would like further research-based evidence regarding the benefits of semi-reclined working postures please contact the author directly at michael@performergonomics.com

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