



PHYSIO CHAIR™ – WHY?

The scientific opinions that support sitting back and relaxing while you work

Sit back and relax. We didn't make up the idea of reclined posture being ergonomically better than "sitting up straight" – we observed it in our patients and at our client organisations like 500 seat call centres, IT programmers, corporate offices. And there is strong scientific support for the reclined posture over the traditional upright 90° posture. The following are a few of the eminent ergonomists who have been advocating a reclined posture for many years.

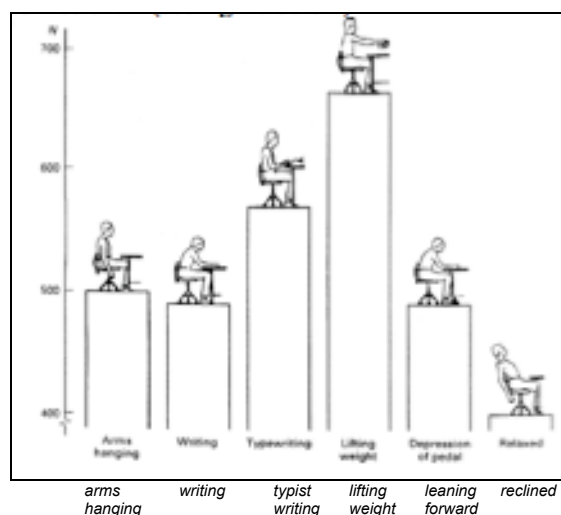
Etienne Grandjean, the father of modern ergonomics wrote in 1988 in the 4th edition of his seminal work, *Fitting the Task to the Man*, "...by increasing the backrest declination (angle) from 90° to 120° a significant decrease in discal load and muscle strain is achieved. These orthopaedic studies suggested that resting the back on a sloping backrest transfers a relevant portion of trunk weight to the backrest and reduces strain on discs and muscles more than it does when sitting straight and upright. It is therefore concluded that VDT operators instinctively do the right thing when they prefer a reclined posture and ignore the recommended upright trunk position."

That was 1988! It's now over 20 years later, but still today we have a widespread misconception that good ergonomic posture is about "sitting up straight".

Professor Alan Hedge, PhD is Director of the Human Factors and Ergonomics Laboratory at Cornell University in New York. He states, "The preferred way of sitting involves the following...Recline back in the chair, with the chair backrest angled between 100°-110° degrees, so that the chair back can help support the weight of the torso."
<http://ergo.human.cornell.edu>. In an article entitled "Ergonomic Seating?" in 2006 Professor Hedge also stated, "Lumbar disc pressure, back muscle activity, and comfort ratings are lowest with a supported recline of 110°-130°."

Kroemer (1994) found by measuring the intra-discal pressure in the 3rd lumbar vertebrae that the lowest measurable forces occurred when the user was relaxed/reclined in an office chair (see chart below).

Disc
pressure
at L3/4



PHYSIO CHAIR™ – WHY? (CONT.)

The scientific opinions that support sitting back and relaxing while you work

CU Ergo, an official ergonomics website from Cornell University, USA reports: “In the ideal typing posture both static and dynamic muscle loads are minimized. This posture is achieved when the keyboard is below seated elbow height and the keyboard base is gently sloped away from the user so that the key tops are accessible to the hands in a neutral posture. In this position the arms, shoulders, neck and back can relax, especially during brief rest pauses. Also, in this slightly reclined sitting position the low back rests against the lumbar support of the chair, the elbow angle is opened to promote circulation to the lower arm and hand, the abdominal angle, and the popliteal angle (behind the knees) are opened to promote blood circulation. The feet rest firmly upon the floor.”

The State Compensation Insurance Fund (of California) journal called *ErgoMatters* (vol. 2, no. 12) stated, “In 2006, a study presented at the annual meeting of the Radiological Society of North America demonstrated the benefits of sitting with a 135° thigh-to-torso angle. Using magnetic resonance imaging (MRI), researchers showed that less strain on lumbar discs occurs in 135° sitting than in traditional 90° sitting. Positive effects of reclined posture sitting had been shown as early as the 1970s. Gunnar Andersson used needles inserted directly into the backs of live volunteers to measure muscle activity and disc pressure in a variety of seated postures. These studies showed a reduction of low back muscle activity and disc pressure with increasing thigh-to-torso angles.”

In field work with major call centres (500+ seats) and regular office workers we have found that when people give up the “posture perfect” 90 degree erect posture and opt for the reclined working posture their neck and shoulder pain often settles and recovers spontaneously. Encouraging people to sit back and break habits of slumping forward and trying to sit up can be the challenge since the fallacy of erect sitting posture is well entrenched in official health, safety and administrative thinking. That’s why we refer to the PhysioChair™ as “21st Century Ergonomics”.

Compiled by Michael Roberts, B.App.Sci. (Physiotherapy),
Director of Ergonomic Solutions, Injury Prevention & Management
Designer of the Physio Chair™ & Co-owner of Perform Ergonomics

For more information about testing or buying the PhysioChair™ please call Ali Roberts at Perform Ergonomics on 0410 431397 or email:

ali@performergonomics.com

You can email Michael Roberts directly at: michael@ipmsafety.com or michael@performergonomics.com