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The importance of being ergonomic

By Helen Thurloe*

ERGONOMICS is the science of designing products, machines and systems to maximise the safety, comfort and efficiency of users. Ergonomics applies to almost any physical human task, from operating machinery to using cutlery.

While the majority of people act instinctively to minimise self harm while working, the science of ergonomics goes further in considering quite specifically how task configuration and tool design can decrease the likelihood of injury.

The term "ergonomics" first appeared in 1857, but it was almost 100 years later, during World War II, that interest in the concept intensified.

Many war-time aviation accidents were originally blamed on human error. Subsequent investigations revealed that poorly designed pilot seating and controls were major contributing factors to these accidents.

Post war, the science of ergonomics broadened to everyday tasks.

The development of ergonomics in the 1940's however, could not have anticipated the revolutionary automation of many workplaces since that time. Rather than fitting tasks to humans, we find ourselves at the beginning of the 21st Century fitting humans to machines, particularly computers.

In almost every business, a computer is essential. For every computer, there is a desk, and for every desk a person sitting on a chair in front of it.

In just the past twenty years the growth in computer based tasks has been astonishing. It is no surprise that for many workers this has also meant a greatly reduced physical range in the work they are required to do, whatever the industry.

Looking at this aspect alone is probably the most relevant to nearly all businesses and organisations, as sitting down to use a computer is an essential task for millions of Australian workers.

While in many ways it has been convenient and aesthetically appealing to standardise equipment and workplace design, including desk and monitor height and types of chairs, the reality is that humans continue to propagate in a wide range of heights and widths, with a "growing" emphasis on width.



Electric height adjustable desks solve the problem of replacing or adapting new furniture as employees of various heights move through an organisation.

Recent figures from the Federal Government's Comcare Research and Analysis Group show that of total body stressing claims from Commonwealth government employees in 2004-05, 32% of claims were from incidents where objects were being handled, but almost 68% of claims were from muscular stress with no objects being handled, or else from repetitive movement with low muscle loading. The majority of these employees have desk based jobs.

The average total cost of body stressing claims from repetitive movement with low muscle loading was over \$34,000, substantially more than each of the incident-related muscular stress categories, which ranged from an average of \$18,799 to \$22,890. Where the repetitive movement involved a back injury, the average cost rose to \$43,430.

Evidently sitting at a computer for most of the day can contribute to intractable

injury, even though it can seem an unlikely place or manner in which to be injured. Appropriate and effective support for the body is essential if we are to "fit the task to the human".

Increasingly ergonomists are re-thinking recommendations for sustainable sitting, such as is required in the modern workplace. Early diagrams depicted idealised sitting, with a "right angle" orientation of the torso to the thigh, and a right angle between the thigh and the calf, with feet both flat on the ground.

A casual look at most people working at their computers in a modern office will confirm that few people adopt this position, and most would declare it not comfortable to work for long periods.

More recently, ergonomic advice has shifted to encourage more movement while working at the computer, with scientific research supporting the desirability of a greater angle between the torso and the thigh in sitting so that a person may be sitting at a higher level with the thigh sloping down from the hip joint, and more weight being taken through the feet.

For some people and tasks, the position of least strain involves a slight forward tilt of the seat pan, to make it easier to balance the bones of the pelvis on the seat surface.

Increasing the need for a range of differently sized furniture with various height options is being recognised. Several European countries now recommend height adjustable desks to quickly and easily accommodate people of different heights, and to vary the position and muscular load of working at differing energy levels throughout the day.

* Helen Thurloe is director of Uplifting Solutions 02 9973 3000.