

## WA1 From the Frugal to the Flamboyant: Ergonomics for Any Budget

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- ❖ Products shown in the presentations in this session merely are examples for illustration purposes only. Inclusion as an example does not imply any endorsement of these products by any of the presenters. Selection of images does not imply any product preferences by the presenters. Audience members should make their own choices and assessments of products that best fit their needs.

## 21<sup>st</sup> Century Ergonomist!

- ❖ Today's ergonomist has an unprecedented choice of information sources, analytical methods and product solutions.
- ❖ Most products have some ergonomic features, but no product can work for everyone in every situation - **There is no universal ergonomics solution.**
- ❖ The role of today's ergonomist is both preventive and reactive. It involves diagnosing the source of workplace problems, identifying opportunities to improve workplace design, and implementing the most appropriate solutions given the constraints of time, cost and feasibility.
- ❖ This session offers some ideas that might help.....

## A Guide to Ergonomic Solutions

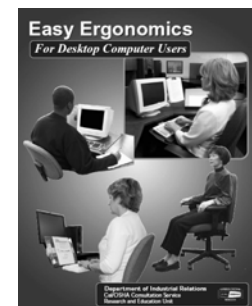
Alan Hedge

- ❖ Many free resources with excellent information are available on the web, for example:

- <http://ergo.human.cornell.edu>
- <http://www.healthycomputing.com>
- <http://www.humancs-es.com>
- <http://www.cdc.gov/niosh/topics/ergonomics/>
- <http://www.ergoweb.com/>
- <http://hf.tc.faa.gov/hfds/>
- <http://www.dehs.umn.edu/ergo/office/checklist.html>



- ❖ Many free publications with excellent information are available, for example:
  - Easy Ergonomics for Desktop Computer Users



❖ Layout changes are “free”, for example:

IF YOU SEE THIS ...



You reach across your body to work because: Your work station does not match your dominant hand (handedness).

TRY THIS ...



Reverse the placement of the computer equipment so that non-keying tasks are performed on your dominant side when you are sitting at your keyboard.

<http://www.dir.ca.gov/dosh/PubOrder.asp>

❖ Proper adjustments are “free”, for example:

IF YOU SEE THIS ...



Your feet do not rest comfortably flat on the floor.

TRY THIS ...



Lower the chair until your feet rest comfortably flat on the floor.

<http://www.dir.ca.gov/dosh/PubOrder.asp>

❖ Some temporary modifications are “free”, for example:

Jon Aquino's “Do-It-Yourself Aeron Ergonomic Chair”



<http://jonaquino.blogspot.com/2005/10/do-it-yourself-aeron-ergonomic-chair.html>

❖ Some simple modifications are “free”, for example:

- Don't use the feet on keyboards!
- Keep mouse close to keyboard and body.
- Hold mouse in neutral hand.
- Take periodic microbreaks!



❖ Standing Trackball Use (Morag et al., 2005, IJIE, 35, 537)

- Trackball platform angle changed from 9° to 24° decline - enables technicians to work with a more neutral wrist posture.
- 62 technicians divided into control and test groups confirmed improved wrist posture.
- New trackball angle implemented on all 900 workstations on the plant-manufacturing floor and became part of the baseline for future designs of all Intel plants worldwide.



Fig. 5. Changing the trackball angle from 9° to 24°.

❖ Many low cost products (<\$25) can help, for example:

Inflatable lumbar support for temporary low back support



<http://www.alimed.com>

Padded forearm supports for Microscope/bench users



<http://www.wedge-ease.com/#>

- ❖ Many low cost products (<\$25) can help, for example:

Phone shoulder rest to reduce lateral neck flexion



<http://www.unisoft.com>

Angled keys to reduce typing ulnar deviation



<http://www.kensington.com>

- ❖ Many low cost products (<\$25) can help, for example:

Adjustable palm support for mouse allow a more neutral hand posture during mouse use



<http://www.mousebean.com/home.htm>

Adjustable cooling cushions for notebook also allow a more neutral hand posture for laptop use



<http://www.laptraxx.com/>

- ❖ Many low cost products (<\$50) can help, for example:

Foam seat wedge may help promote more relaxed lower back lordosis



<http://www.alimed.com>

Adjustable foam lumbar roll to support lower back



<http://www.alimed.com>

- ❖ Many low cost products (<\$50) can help, for example:

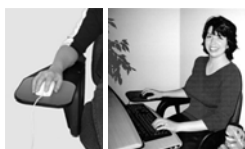
Smaller keyboard and laptop mouse reduces shoulder abduction



Keyboard - <http://www.btc.com.tw> Mouse - <http://www.logitech.com>

- ❖ Many low cost products (<\$50) can help, for example:

Chair arm mouse platform to promote a more neutral mousing arm posture



<http://www.mousearm.com>

Anti-fatigue mat to promote less fatigue during prolonged standing



<http://www.uline.com/>

- ❖ Many low cost products (<\$100) can help, for example:

Left-hand keyboard allows right handed mousing closer to body midline



<http://www.fentek-ind.com>

Keyboard with separate number pad allows right handed mousing closer to body midline



<http://www.logitech.com>

- ❖ Many low cost products (<\$100) can help, for example:

Keyboard with built-in trackball



<http://www.fentek-ind.com>

Keyboard with built-in touchpad



<http://www.fentek-ind.com>

- ❖ Many low cost products (<\$100) can help, for example:

Ergonomic split keyboard with integrated touchpad



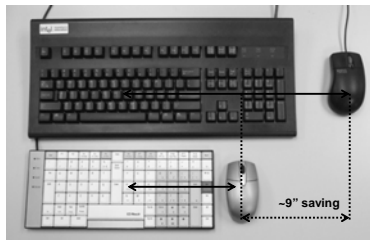
<http://www.fentek-ind.com>

Ergonomic split keyboard may promote more comfortable, neutral wrist posture during typing



<http://www.microsoft.com>

- ❖ Many low cost products (<\$100) can help, for example:  
Smaller alternative split keyboard and laptop mouse reduces shoulder abduction and improves wrist posture



Keyboard - <http://www.typematrix.com> Mouse - <http://www.logitech.com>

- ❖ Many low cost products (<\$100) can help, for example:

Adjustable size, mouse and trackball allows for varied posture and 1 or 2 handed use



<http://www.perific.com>

Vibrating mouse to alert user to take microbreaks



<http://www.hoverstop.com>

- ❖ Many low cost products (<\$100) can help, for example:

In-line document holder may help to reduce neck/shoulder strain



<http://www.safecomputing.com>

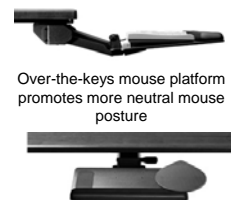
Anti-glare screen may help to enhance screen contrast and reduce eyestrain



<http://www.mmm.com>

- ❖ Many moderate cost products (<\$250) can help, for example:

Negative-tilt ergonomic keyboard tray promotes more wrist neutral keyboard use



<http://www.humanscale.com>

LCD Monitor arm allows greater screen position adjustability



<http://www.ergotron.com>

- ❖ Many medium cost products (<\$500) can help, for example:

**Ergonomic chairs:**

promote greater seat comfort and body support



<http://www.humanscale.com>



<http://www.teknon.com/>



<http://www.hermanmiller.com/>

- ❖ Many higher cost products (<\$1000) can help, for example:

Manual adjust Sit-stand workstation – allows postural variety



<http://www.ergostoreonline.com>



Sit-stand chair – allows postural variety



<http://www.healthpostures.com>

- ❖ High cost products (>\$1000) also can help, for example:

Powered sit-stand workstation – allows postural variety



<http://www.workritergo.com>

Fully integrated workstation – allows control of environmental conditions



<http://www.poetictech.com/aura/>

- ❖ Ergonomists have an arsenal of analytical tools to diagnose a variety of problems.
- ❖ Ergonomists have a plethora of products with which to solve these problems.
- ❖ Often, low cost, well thought out responses will resolve many problems situations, at least in part until a comprehensive solution is available or affordable.
- ❖ Ergonomists play a vital role in selecting the right solution to the problem.



<http://www.dehs.umn.edu/ergo/office/checklist.html>

- ❖ Questions and Comments