

The invisible aspects of work

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There's more to work than meets the eye.

- It's the things you don't see that can hurt you.
- These invisible problems can reduce productivity, and can hurt and harm.



What you're not seeing

- Pain from fixed, stiff, awkward postures
- Overload sprains from jerky or forceful actions
- Sore and tired eyes from glare and flickering lights



You're not seeing this either

- Inefficiency from poor materials handling
- Irritation and broken concentration from noise, distractions and interruptions
- Bad feelings from lack of control over own work
- Depression from lack of social and functional support

The long list approach doesn't work

- All the problems, all the answers... but what do you do first? You can't tell.
- So we won't give you long lists of problems and solutions.
- Instead, we'll try to tell you what is really important, so you can work it out for yourself.

It's not easy to understand!

- In the 80's we found that people who learned to relax their muscles as they worked reduced or eliminated their pain.
- This wasn't as "physical" as it sounds.
- Our interventions often did a lot more than relax muscles. We were restoring power to the individual worker, while we trained them to use their muscles better.

Acute problems are easier

- Industrial sprains are often simple mechanical overloads.
- They come on quickly, are severe, but after simple intervention they usually resolve (nearly) completely.



Acute problems – often very localised

Single actions, repeated excessively, can produce ganglions like this in unlikely places!



Slow problems are harder

- For instance...
- Pain from fixed, stiff, or awkward postures
- Pain from torn connective tissue inserts into bone
- “Stress” (whatever that means – more about it later).

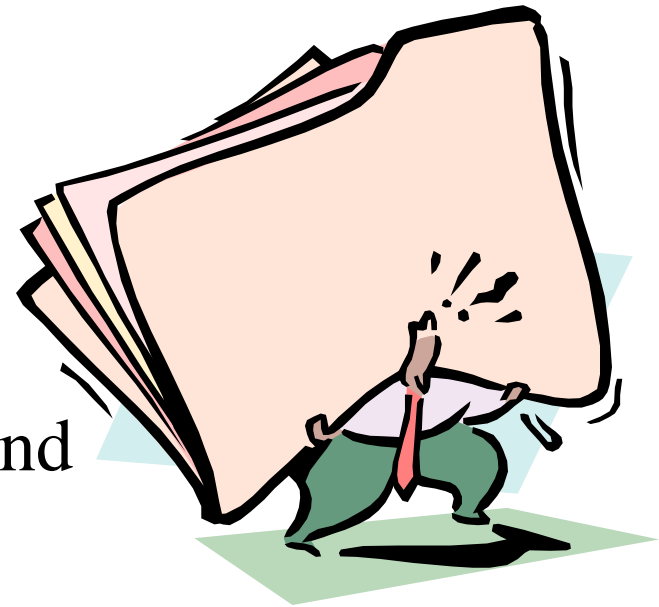
What is posture anyway?

- The position of
 - head,
 - neck,
 - arms,
 - wrist and hand, and
 - low back.

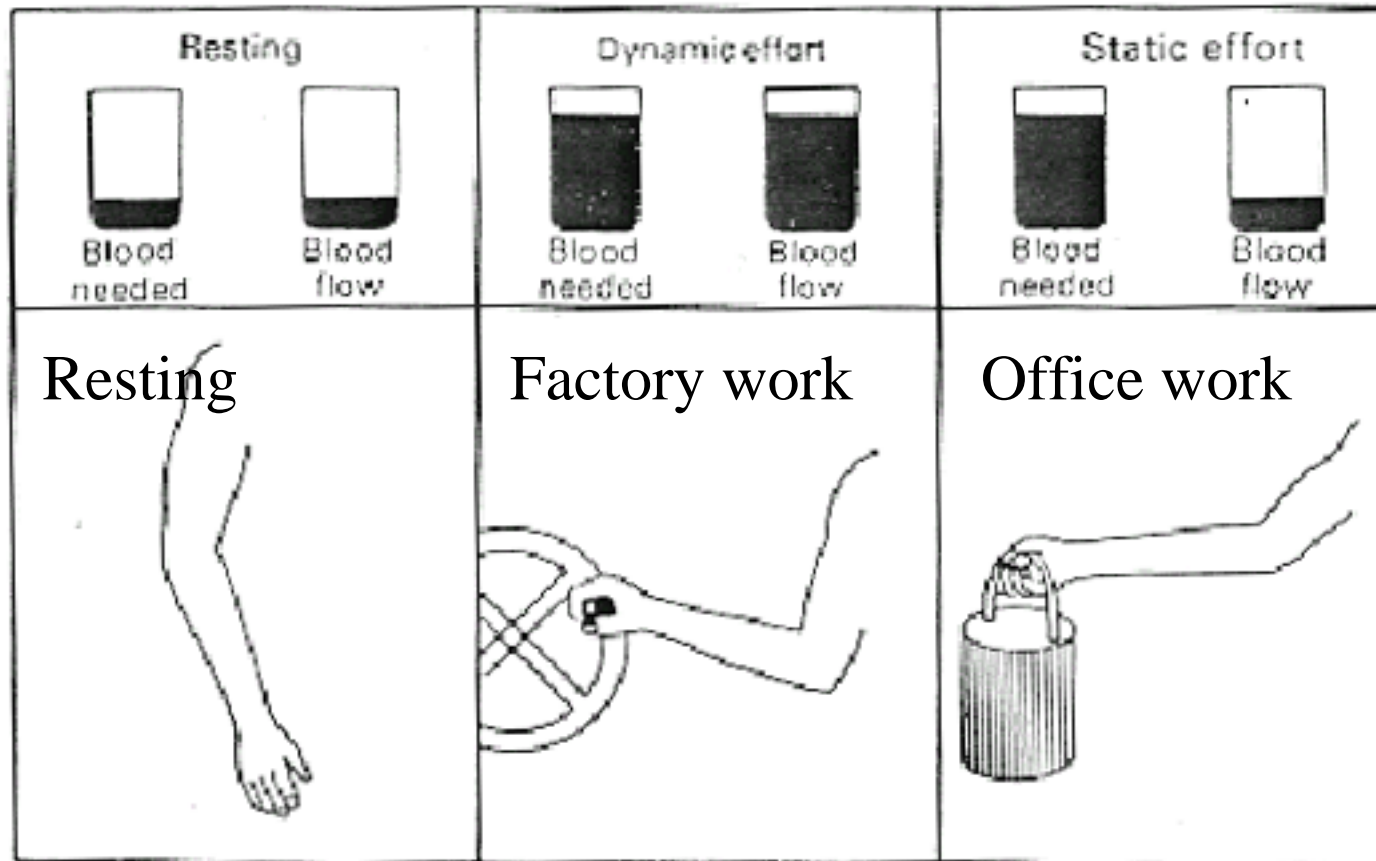


Why fixed postures hurt

- Fixed postures require sustained muscle tension.
- This interferes with blood flow, and prevents the clearance of metabolic waste products such as lactic acid and ammonia.
- These substances stimulate pain nerve endings (ie they hurt).



Blood flow vs need



Office work can be more painful than factory work!

Fresh Muscles video

- For more information on muscular discomfort, here are the first few minutes of our Year 2002 version of **“Fresh Muscles: Preventing Fatigue at Work”**.

(Shown at workshop – not yet available on website)

Desk too high, or chair too low

- At a high desk, people work with shoulders raised, or elbows held out or up, and wrists awkwardly bent.
- Result: Sore shoulders, neck, forearm, or wrists!
- So adjust the chair and/or desk so that the arms hang relaxed while the person works.



Case study

– desk height

- Desk high: 12.0 microvolts EMG in shoulder muscle – tiring!
- Desk low: 2.2 microvolts EMG - much better!



Visual task too low (eg reading)

- Person has to look down constantly
- Result: sore neck and upper back
- Solution: Raise the visual task (eg use a document holder) to straighten the neck.



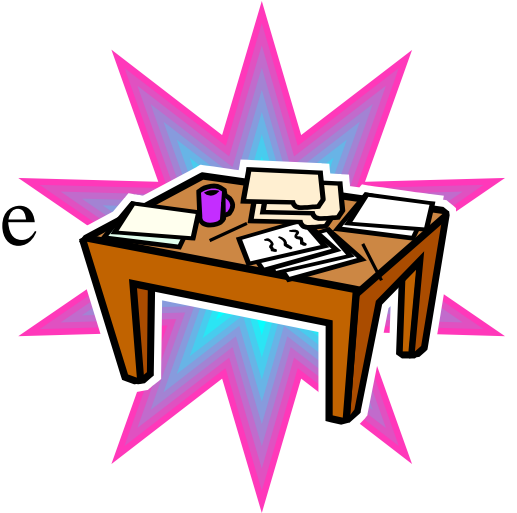
Computer mouse

- Mouse use is now a major cause of neck, shoulder and forearm pain.
- Users need free placement of mouse next to keyboard, or instead of keyboard.
- So keyboard areas need to be wider than before.
- Keyboard trays might not work!



So what makes a good desk?

- 900 mm depth for CRT screens
- Thin (20-25 mm), sturdy front edge
- Height adjustment a good feature particularly for multi-user workstations
- Sufficient storage and display area for work documents
- Sufficient work area for mouse



Depth of desk

- Larger computer screens can increase worker efficiency by reducing the need to scroll.
- For financial tasks, 17 and 19 inch screens should be used.
- Office desks designed for writing, and older style workstations, are not deep enough for large screens.

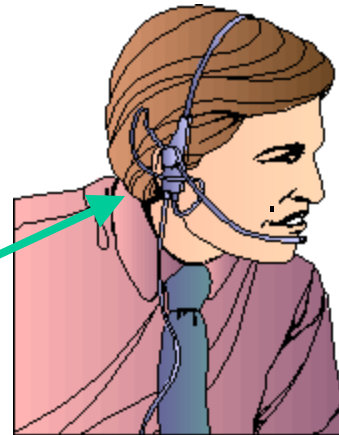


If space is tight and expensive, consider alternatives

- Flat screen monitors (LCD) continue to fall in price (Jan 2003 price = \$500). Buying these might be cheaper than renting a bigger office
- Windows 98, 2000 and XP support multiple monitors – eg two 15” monitors will fit side by side on a narrow desk and can replace one large screen
- Compact data projectors can replace bulky computer screens, and can provide a very large and bright image with zero thickness!

Materials handling

- Frequently used materials within easy reach, or they won't be used!
- Example: telephone headsets are vital for comfort, but if they can't be stored and retrieved easily, they won't be used.



Sore, tired eyes

- Glare and flicker are major problems. Consider:
 - Contrast ratio between furniture and screen
 - Flicker from inbuilt lighting
- Visual relief (looking into the distance) is also very important.



Cheap fluorescent lights flicker

- You can't necessarily see the flicker, but it can still affect you!
- Flicker can cause headaches and eyestrain.
- Overhead lights and built-in lights can cause problems.
- High frequency ballasts solve it.

Wrongly adjusted VDU's flicker

- Many VDU's in offices are set at a refresh rate of just 60 Hertz.
- This causes visual discomfort in more than half of workers who use the screen for long periods.
- Recommended refresh rate: 85 Hertz (World Health Organisation).
- Nearly all modern screens can support 85 Hertz. It just takes a simple adjustment in Windows.

“Stress”

In 1985 we said

Fatigue + Stress = “RSI”

Research since has confirmed this.

Fight entropy!

- Disorder naturally prevails – piles fall over, clips come undone.
- A lot of time can be wasted looking for parts of a task.
- So **LOCK** the elements of a task together!



The Pocket Stress Reliever

A tool for talking people through the causes and solutions to stress.

Facilitate task completion

- We only relax and get a sense of satisfaction when we finish something.
- Keeping parts of a task together means you can file the task as one unit.
- Then you get the sense that you have really finished!

Multiple tasks

- If the person has multiple tasks, the workstation needs to support ‘suspend and resume’.
- Suspended tasks must be out of peripheral vision, or they will continue to ‘nag’. Use cupboards with doors, project boxes with lids...



Complex tasks are different

- Complex tasks require long periods of uninterrupted concentration.
- If the workplace doesn't support this, the person finds themselves back at the starting point again and again.
- In the worst case, a complex task never gets finished at all!

Approaches to complex tasks

- Provide one or more quiet ‘complex task’ rooms which can be booked by staff
- Allow staff to work at home for a morning
- Train staff to structure their complex tasks, so they can finish ‘chunks’ between interruptions

Being accessible vs finishing complex tasks

- You can have them both, but not at the same time.
- Example- “Answer the phone in 3 rings” is incompatible with finishing complex tasks!



Tools against entropy

- Accessible shelves, cupboards and suitable boxes to put on them
- Filing cabinets (if the person knows how to use them)
- Zip lock plastic bags
- Transparent folders with full depth pockets

Social issues in workstation grouping

- Too regimented - bad feelings from lack of control over own work
- Too isolated - lack of social and functional support
- Too cheap, or looking like a 'factory hen' – feelings of not being valued

Conclusion

- Don't take a long list approach.
- With individuals, work simply from symptoms (Pocket Ergonomist, or Road to Comfort).
- With groups, provide quick education, promote comfortable work postures etc, but focus mainly on the key issues of control and social relationships.