

The Pocket Ergonomist

INDUSTRIAL / RETAIL VERSION



WHAT CAUSES FATIGUE?

If a muscle is kept contracted, or if it contracts repeatedly at high strength, it can become tired or sore. By reducing this tension, by introducing micropauses and by performing workplace exercises to relax and warm up muscles, fatigue can be minimised.

This guide describes simple, practical methods that we have used to reduce fatigue, in factories, warehouses and supermarkets. We trust you will find them just as useful as we have.

David Brown and Robin Mitchell

To investigate a report of an ache, soreness or weakness, use this index

Neck:

Head posture
or stress Page 5

Shoulders:

Workstation,
workstyle or stress
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Forearm and hand

(Upper surface):
Page 7

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Back:

Chair work height
or posture
Page 6

Legs:

Loss of circulation
Page 6



THE STRATEGY

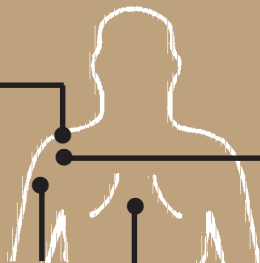
1. **Educate employees** about the role of tension and posture in discomfort.
2. Ask each employee to **report any discomfort**. The OSH publication *Occupational Overuse Syndrome: Checklists for the Evaluation of Work* will simplify this enquiry.
3. Use this *Pocket Ergonomist* to **find possible causes and remedies**. Keep trying until the operator reports feeling better. A Muscle Biofeedback Monitor electromyograph helps to prioritise the causes of each person's discomfort. If one is not available, work through the list and correct all errors found.
4. Introduce **natural relaxation pauses (micropauses)** to interrupt tension. For example, relax one hand, even for a moment, if only the other is needed.
5. **Rotate employees among tasks** where possible, if this varies the muscle load. Take care! Rotation can have social side effects, e.g. it can be seen as punishment ("he took me off my favourite job"), or can separate friends.
6. If stress is a problem, **ask employees** what causes it. Where possible, change job design (for problems of work rate, perceived lack of control, or stock build-up) or train supervisors (for problems of social stress) to eliminate tension at source. Then establish what the person can do themselves to stop tension getting out of control, and **practice the solution with them**.
7. **Demonstrate exercises and supervise their practice**.
8. Now ask **the employee** to summarise the key points of their new relaxed work methods, and **write these down**. These key points should be succinct, for example "drop shoulders; relax hands in lap when waiting".
9. Check again within two weeks. If the employee does not report a substantial improvement, call your occupational health and safety co-ordinator.

Very important: you (the investigator) should relax too.

SHOULDERS AND BETWEEN SHOULDER BLADES

1. Sore on top:
shoulders kept
raised

2. Sore behind top
shoulders kept
pulled back



3. Sore outer shoulder:
elbows kept stuck out

4. Sore between shoulder blades
arms kept forwards;
leaning over; stress

CAUSE OF TENSION

ACTION

1. Top of shoulder

(a) Work too high

Lower bench or equipment, or raise person (support feet if seated)

(b) Armrests foul elbows

Remove or lower arm rests

(c) Chair backrest is too wide

300 mm max. Modify/replace chair or backrest

(d) Untrained worker is tense

Train shoulder-elbow work technique

"Drop shoulders, hang elbows loose"

(e) Stress

Reduce stress at source, e.g.
- self-control of work pace and flow
- train supervisors to be positive

Alternate with less stressful duties

Reduce stress reactions (relaxation/communications training)

2. Behind shoulder

(a) Same as "Top"

See 1(a) to (e)

(b) Work too far away

Bring work closer so elbow(s) hang more vertically (also 6)

CAUSE OF TENSION

ACTION

3. Outer shoulder: elbows held out to side

- (a) Same as "Top"
(Some raise shoulders, others move elbow)
- (b) Tools or parts too far to one side

See 1(a) to (e) to correct working height, chair height and backrest, workstyle, stress
Reorganise work area to bring them closer to midline so arms hang more vertically

4. Between shoulder blades

- (a) Work too far away
- (b) Employee leans forward to see work
- (c) Stress

Bring work closer so elbow(s) hang vertically
Raise visual task to straighten upper back (see also 6)
See 1(e)

THE NECK

5. Sore at base of neck: forward lean of head

6. Soreness continues down back: hunched over work



7. Sore at top of neck: chin held up/juts forward

8. Sore one side of neck: head constantly turned

CAUSE OF TENSION

ACTION

5. Base of neck:

- (a) Visual task too low, so head stays bent to see work

Raise visual task
Support elbows if necessary to reduce shoulder load

6. Upper back:

- (a) Same as for (5)
- (b) Chair too low or high (especially for writing)
- (c) Same as for 2(b)

Raise visual task as above
Adjust chair and educate, or write with arms supported
Bring work closer

7. Top of neck:

- (a) Visual task too high
- (b) Bifocal glasses worn
- (c) Stress

Lower visual task/ rotate staff
Obtain task-specific glasses
Reduce stress, see 1(e)

8. One side of neck:

(a) Main visual task to one side

Centre the visual task by moving task or operator

BACK AND LEGS

9. Lower back: prolonged stooping posture; poor standing posture; or any constant back tension

10. Lower legs: Circulation cut off by chair cushion or lack of foot movement

9. Lower back: (person seated)

(a) Chair backrest too high or low

Readjust so backrest firmly supports the "small" of the back (lumbar region)

(b) Backrest not used

Move backrest forward to support lower back. If not possible, modify/ replace chair

(c) Person slumps forward

See 5 and 6

(d) Buttocks not to rear of chair

Move backrest forward, or educate person to sit back

Lower back (person standing)

(e) Prolonged stooping

Raise work or limit time spent. Exercise!

(f) Poor standing posture (sway back)

Exercise to relax back and tighten stomach

(g) Lifting overload

Assess task

10. Lower leg (person seated):

(a) Feet not supported

Provide footrest/ lower chair and work surface

(b) Chair cushion too deep

Replace chair

(c) Hard front on cushion

Replace chair

Lower leg (person standing):

(d) Lack of movement

Alternate jobs; supply easy-standing mats

FOREARM AND HAND (UPPER SURFACE)

11. Sore upper surface:

excessive force; hand or finger held back

12. Sore outer surface or elbows:

hand/little finger held sideways, or repeatedly jerked

13. Sore hand
(little finger end):
overstretch/hammering

CAUSE OF TENSION

ACTION

11. Forearm upper surface:

(a) Excessive force used (heavy force applied, awkward/inefficient position used)

Check tools and improve where possible; then train relaxed work technique. Introduce micropauses and rotate jobs.

(b) Person rests forearm and stretches hand

First remedy shoulder load (see 1); train operator to use neutral wrist angle

(c) Operator bracing wrist

Train relaxed work style

(d) Lack of micropauses or poor job variety

Build in relaxation and variety; drop hands between items, etc. See 1(e)

(e) Stress

See 1(e) for stress reduction

12. Outer surface/elbow:

(a) Screwdriver, knife etc. used forcefully with bent wrist

Change to pistol-grip tools; redesign job; train in better technique

(b) Vibrating tool held tight

Change/modify tool or job

(c) Elbow(s) held out

See 1(a) to (e)

(d) Calculator at wrong angle

Turn calculator to straighten wrist

(e) Wrist is bent to reach items or controls

Train: "Move hands don't bend wrist"/reposition work

13. Hand (little finger end):

(a) Overstretching fingers (also see 12(c))

Use two-hand grip; change tool handles

(b) "Hammering" action

Use real hammer, not hand

FOREARM AND HAND (PALM SURFACE)

14. Sore flexor muscles:
oversqueezing

15. Sore flexor, outer side:
wrist/ little finger held
sideways



16. Sore little finger
overstretch or "banging"

17. Sore thumb muscle
sustained pressure

CAUSE OF TENSION

ACTION

14. Forearm flexor muscles:

(a) Tool requires excessive grip force

(b) Components do not fit properly

(c) Small components used or high precision needed

(d) Untrained operator uses excessive squeezing force

15. Flexors (outer/ ulnar side):

Same as for upper surface

16. Little finger:

(a) Overstretching fingers

(b) "Hammering" action

17. Thumb muscle:

(a) Folding materials using thumb to crease

(b) Tool uses thumb press

(c) Writing with awkward thumb angle

Is the tool faulty? Can the grip pressure needed be reduced by a different tool design?

Call quality control! Inspect incoming parts; check previous stages on production line

Provide easier grip on tools; provide lead-in on jigs and mating parts; improve lighting

Train operator to squeeze less, e.g use biofeedback

See 12

See 13(a)

Use real hammer, not hand

Use back or side of hand/ folding block or blade

Alter to power grip

Replace pen/ add rubber grip/ train writing style