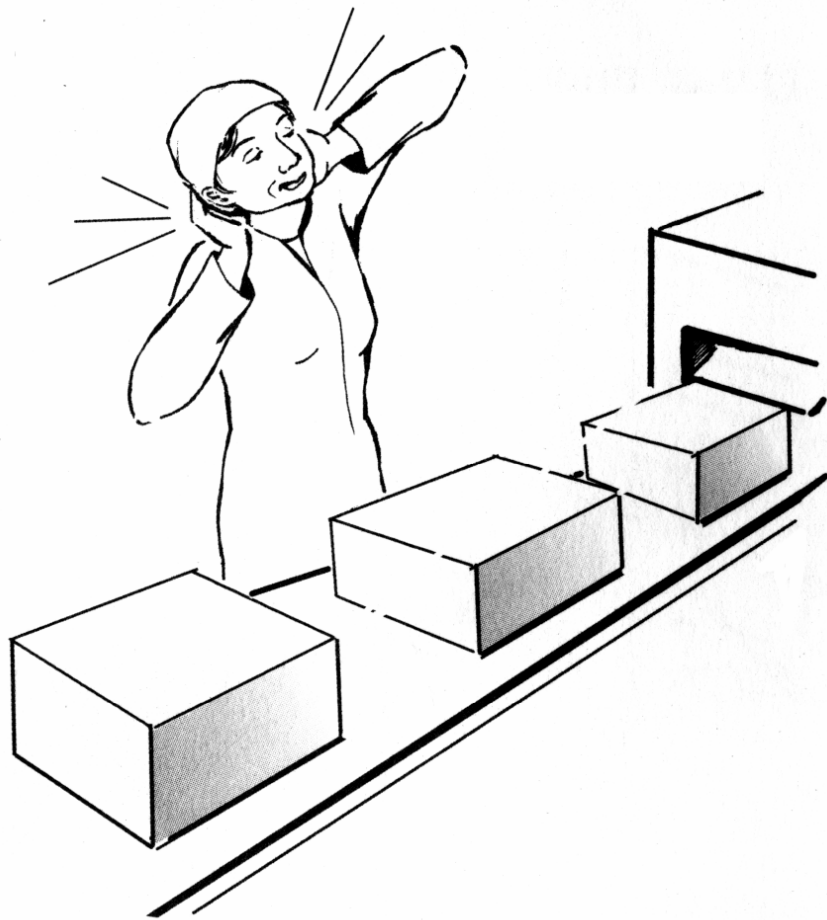


SECTION 6

Ergonomics



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Ergonomics: Fitting the Job to the Worker

Fit the job to the worker, not the worker to the job!

Ergonomics looks at:

1. How people do their work.
2. What body movements and positions they use when they work.

3. What tools and equipment they use.

4. What effect all of these have on their health and comfort.

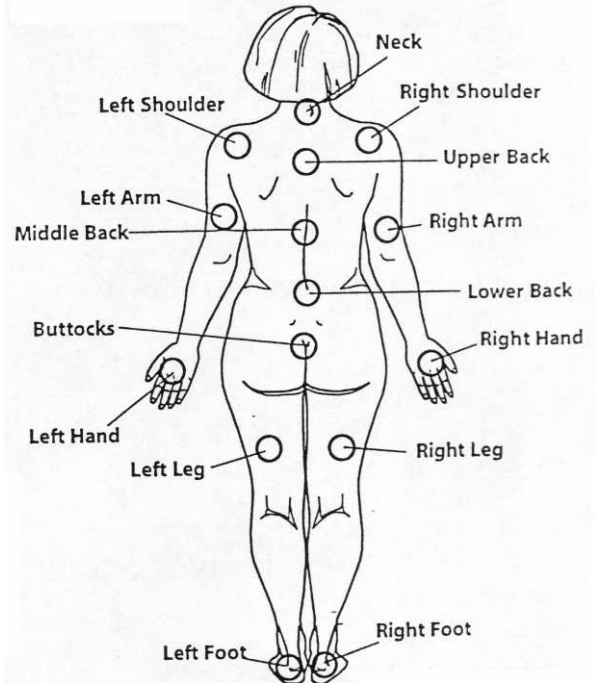


Injuries to the Body Due to Overuse

1. Put yourself in this worker's job.



2. Mark where this worker could feel pain.



3. Check the things that could increase the chances for this worker to overuse her body.

- a. Repeating the same movement
- b. Force/weight
- c. Awkward posture
- d. Vibration
- e. Extreme cold and/or heat
- f. Other reasons:

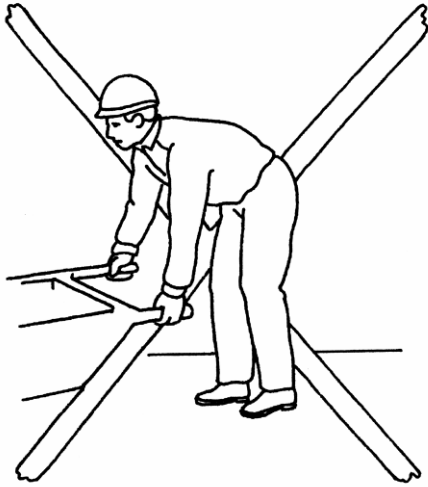
4. Describe why you checked the items in box 3.

Ergonomic Risk Factors

Workplace elements that cause wear and tear on your body and can cause injury. To prevent injuries, you should first identify any risk factors. Once these have been identified work on finding ways to eliminate them.

Risk Factors	Definition	Possible Solutions
High Repetition	Performing the same motion over and over.	<i>Redesign</i> task to <i>reduce</i> the number of repetitions, motions, or increase recovery time between repetitions, or <i>rotate</i> to different jobs.
Excessive Force	Excessive physical effort needed to do the work – pulling, pounding, pushing. The more effort, the harder your body works.	<i>Reduce</i> the exertion needed to accomplish the task, redesign task; assign more staff, use mechanical assists.
Awkward Posture	Bending or twisting any part of your body.	<i>Design</i> tasks, equipment and tools to keep the body in natural or “neutral” positions.
Static Loading	Staying in one position too long, causing muscles to contract.	<i>Design</i> tasks to avoid static positions, provide opportunities to change positions.
Direct Pressure	Contact of the body with a hard surface or edge.	<i>Improve</i> tool and equipment design to eliminate the pressure, or provide cushioning material.
Vibration	Using vibrating tools or equipment.	<i>Isolate</i> the hand from vibration.
Extreme Cold and/or Heat	Cold reduces feeling, blood flow, strength, and balance. Heat increases fatigue.	<i>Insulate</i> the body; control temperature.
Poor Work Organization	Includes: machine-paced work, inadequate breaks, monotonous tasks, and multiple deadlines.	<i>Reasonable</i> workload, sufficient breaks, task variety, individual autonomy.

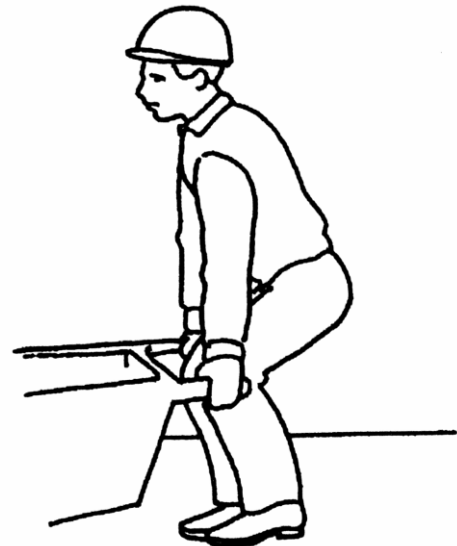
Check your Job for “Risk Factors”



Does your job make you do these things over and over:

- Bend and/or twist your wrists?
Twist your arms?
- Hold your elbows away from your body?
- Reach behind your body?
- Lift or throw things above your shoulders?
- Lift things from below your shoulders?
- Use a pinch grip?
- Work with your neck bent?
- Make forceful cuts on pieces of meat or parts of chicken?
- Lift heavy things?
- Use one finger or your thumb to operate a tool?
- Use a hand tool with hard, sharp edges?
- Use a tool that vibrates?
- Use your hand like a tool or a hammer?
- Work in the cold?

If you answered “yes” to any of these questions, you may be in danger of getting a cumulative trauma disorder (CTD).



Common Ergonomic Injuries

Injury	Symptoms	Typical Causes
Bursitis: inflammation of the bursa (sack-like cavity) between skin and bone, or bone and tendon. Can occur at the knee, elbow, or shoulder	Pain and swelling at the site of the injury	Kneeling, pressure at the elbow, repetitive shoulder movements
Carpal tunnel syndrome: pressure on the nerves which pass up the wrist.	Tingling, pain and numbness in the thumb and fingers, especially at night.	Repetitive work with a bent wrist. Use of vibrating tools. Sometimes follows tenosynovitis (see below).
Ganglion: a cyst at a joint or in a tendon-sheath. Usually on the back of the hand or wrist	Hard, small, round swelling, usually painless.	Repetitive hand movements.
Tendonitis: inflammation of the area where muscle and tendon are joined.	Pain, swelling, tenderness and redness of hand, wrist, and/or forearm. Difficulty in using the hand.	Repetitive movements.
Tenosynovitis: inflammation of tendons and/or tendon sheaths	Aching, tenderness, swelling, extreme pain, difficulty in using the hand.	Repetitive movements, often non-strenuous. Can be brought on by sudden increases in workload or by introduction of new processes.
Tension neck or shoulder: inflammation of the neck and shoulder muscles and tendons.	Localized pain in the neck and shoulders.	Having to maintain a rigid posture.
Trigger finger: inflammation of tendons and/or tendon sheaths of the fingers.	Inability to move fingers smoothly, with or without pain.	Repetitive movements. Having to grip too long, too tightly, or too frequently.

What do you do if you think you have a cumulative trauma disorder?

Notify your employer

Do this with a witness or in writing and keep a copy for yourself.

See a doctor as soon as possible

Because cumulative trauma injuries develop slowly, workers often ignore the symptoms until they become severe. By that time, the injury may be permanent. Make sure you explain to your doctor the type of work you do.

Document

Keep notes of the events related to this injury, including whom you spoke to and when, as well as all medical expenses related to the injury and any conversations with or correspondence from your employer. These notes could be invaluable if a dispute arises regarding your injury.

Contact your union, if you have one, for assistance.



Evaluating a Job

Break the work down into the smallest pieces possible so that your evaluation can be specific and detailed.

The evaluation should include three parts:

- A. Job Description
- B. Observation and measurement (checklist)
- C. Worker symptoms (survey/interviews)

A. Job Description

Collect information to fully describe each specific task, job, workstation, tool, and/or piece of equipment you will evaluate.

Include

- job name and location
- number of people involved and job titles
- work activities or tasks involved
- equipment and tools used
- production requirements
- work schedule
- general work environment (such as...)



B. Observation and measurement

Evaluators need to look at:

- how people move
- positions people work in
- how long people perform specific activities
- weights of objects handled or moved
- dimensions of workstations, tools, and equipment
- temperature of work area.

The most effective way to record this information is to use an ergonomic checklist.

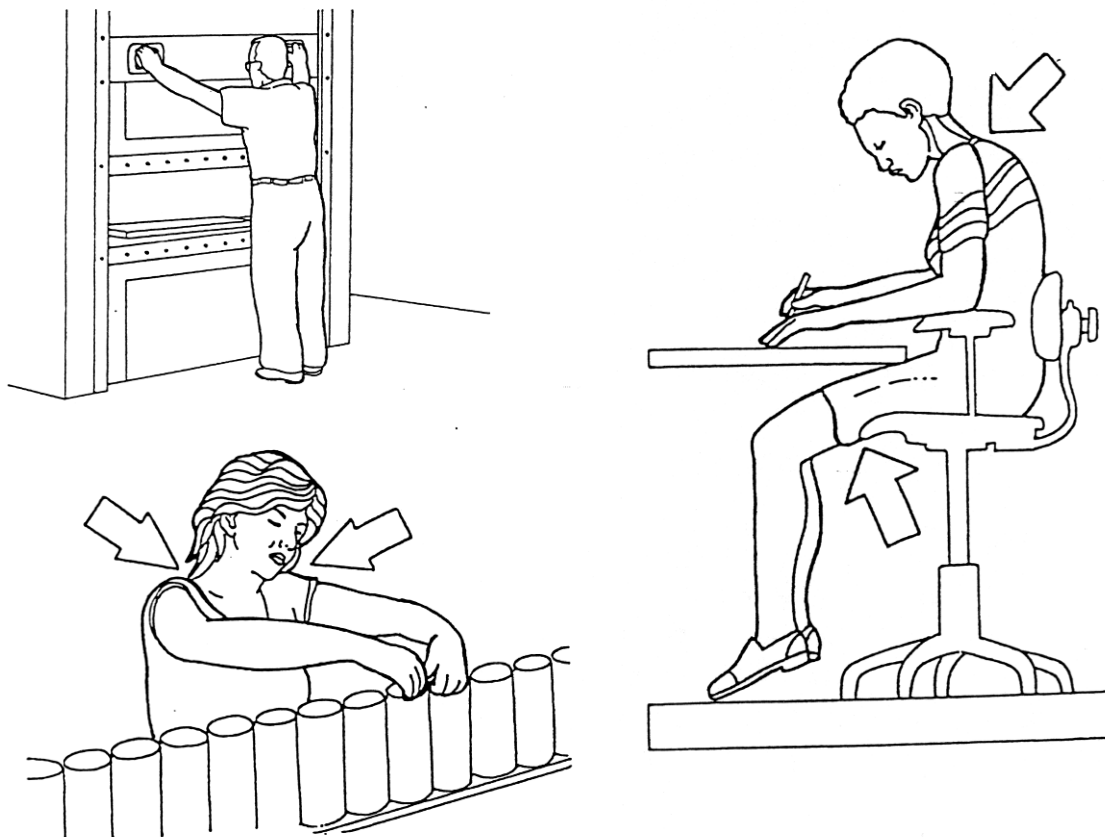
You can also take photos.

C. Worker symptoms

When conducting the evaluation be sure to ask workers:

- whether they experience pain or discomfort while performing the job, and
- what activities trigger that pain.

The relationship between pain or discomfort and specific activities can assist in pinpointing tasks, workstations, equipment, or tools that may be causing or aggravating ergonomic-related injuries. You can gather this information either through individual interviews or through employee questionnaires or symptom surveys.



What are Ergonomic Controls

Overview: Three Types of Ergonomic Controls

Ergonomic controls are used to help fit the workplace to the worker. They seek to place the body in a neutral position and reduce the other ergonomic risk factors. These controls must accommodate the widest range of personnel.

Ergonomic Controls are grouped into three main categories, in order of the preferred method of preventing and controlling ergonomic risk factors.

1. Engineering Controls are the preferred method of control because they are more permanent and effective at eliminating ergonomic risk factors.

Engineering controls include modifying, redesigning or replacing:

- work stations and work areas
- materials/objects/containers design and handling
- tool section
- equipment

2. Administrative Controls

Administrative Controls deal with how work is structured, such as

- work scheduling
- job rotation and rest breaks
- exercise programs
- maintenance and repair programs

3. Work Organization

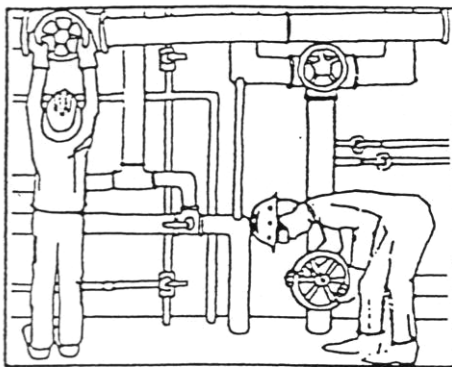
Reasonable workload, sufficient breaks, safe comfortable work environment, and task variety.

Ergonomics: Examples of Practical Solutions to Improve Job Design

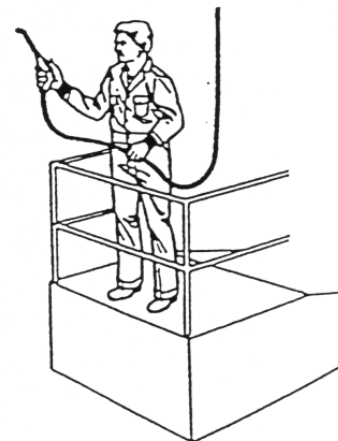
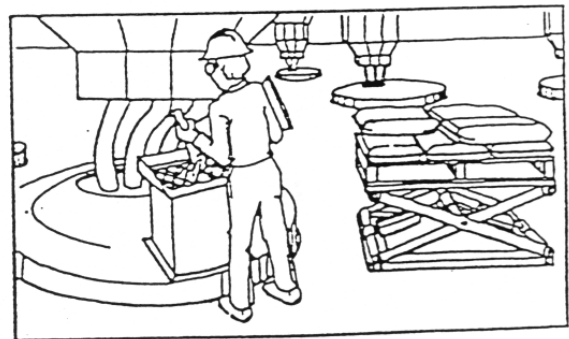
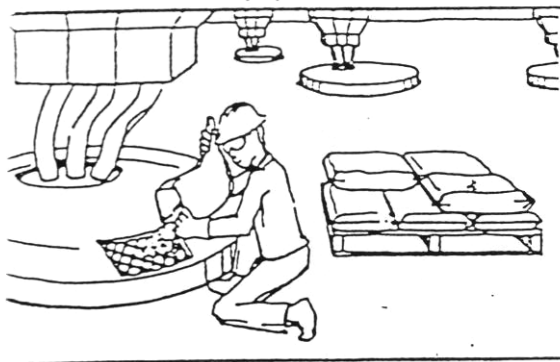
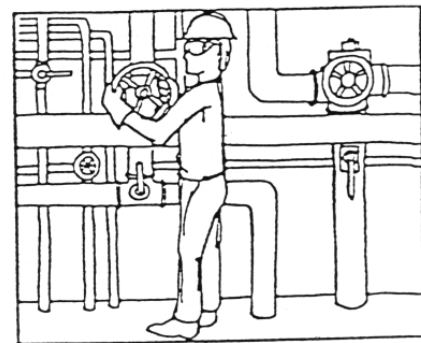
There is always more than one solution to a problem. In many cases, relatively simple and inexpensive changes can make a big difference/

Here are a few examples:

BEFORE



AFTER



Sewing Machine Operators

***Feel Better!
Work Better!***



Position that may cause pain

- ▶ How to Prevent Job-Related Pain
- ▶ How to Adjust Your Chair and Other Equipment to Fit Your Body

There are many ways your work area can be made more comfortable for you.



Position that may be more comfortable

FEBRUARY 2001

California Department of Health Services • California Department of Industrial Relations

Is your job causing you pain?

- Pain, numbness, or tingling in the shoulders, neck, back and hands affect many sewing machine operators. These symptoms may be related to your job.
- Symptoms may start gradually. Many people try to ignore them at first. But if you ignore them, symptoms can get worse and become harder to treat. Inform your employer and get medical care right away if you have symptoms.
- These symptoms may indicate a serious injury that can interfere with your work and personal activities. They can even lead to permanent disability.



Why do sewing machine operators have these problems?

- An uncomfortable work position. Sewing work forces you to hold your body in one position for long periods. If it is an uncomfortable position, pain and injury can result. Your position is determined by the “fit” of your chair and foot control, your need to see the work, and your need to grasp or hold materials in place.
- Repeated or forceful motions. Reaching, stitching, pinching, pulling... hundreds of times a day. Each motion can cause small injuries to muscles and joints.
- Long work hours and few breaks mean less time for muscles and joint injuries to heal.

- **Hard edges.** If the edge of your chair, worktable or table legs press into your body for long periods, it can damage nerves or other soft body parts.

How Can Injuries Be Prevented?

By law, your employer is responsible for providing a safe and healthy workplace. Here are some things you and your employer can do to prevent injuries:

- **Talk with others at work.** Do workers have symptoms? Are the causes of injury present? Does the employer know about preventive actions to take?
- **Use adjustable chairs.** Employers should get durable industrial chairs that have:
 - adjustable seat heights
 - padded seats
 - swivel bases
 - five legs (not four)
 - padded adjustable backrests

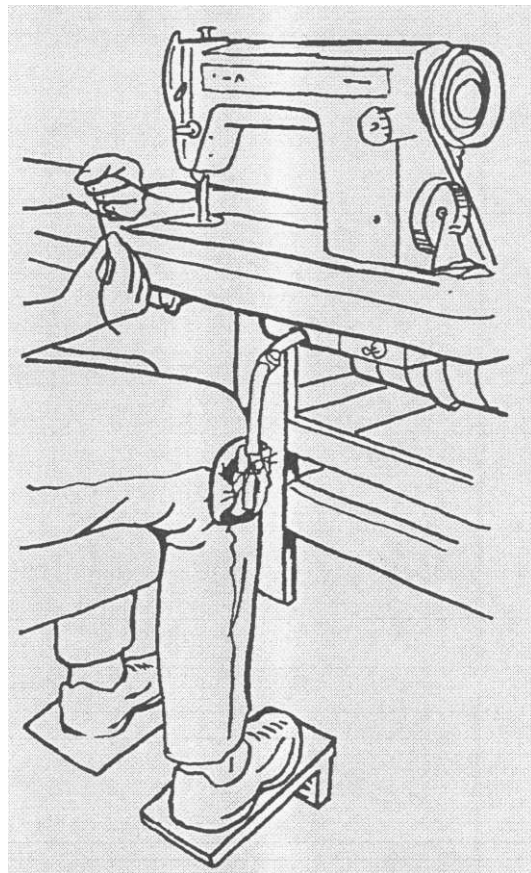
Carefully evaluate chairs with built-in footrests and arm rests to make sure they fit workers and the movements they make. If these parts don't fit, adjust or remove them.

- **Use foot supports.** Foot supports are an important part of the seated workstation. Employers may need a mechanic to adjust, install, or build up foot supports in the right position for each worker (height, forward/back and left/right).
- **Adjust your equipment to “fit” your body.** (See box showing comfortable position on page 190.)

- Improve lighting. Employers should provide “gooseneck” lamps (in addition to general room light) for each sewing machine, if possible. Don’t use extension cords; they can cause tripping or fire hazards. Older individuals need brighter light. Point the light so there are no shadows where you stitch or prepare work.
- Check your vision. Prescription eyeglasses or contact lenses may help you at work. Employers can help by providing time off and vision care insurance.
- Make reaching easier. Avoid twisting your back, or long reaches.
 - Stack your materials and finished pieces close to you.
 - Place bins and carts as close as possible.
 - Install convenient shelves or tool holders if needed.
- Provide training. A trainer/consultant should help each operator adjust her entire workstation, including chair and foot supports. Operators need to learn how to work the chairs, and what adjustments to make. Also, have the consultant train a few operators to assist their co-workers. Each worker should know the early warning symptoms of injury.
- Take tiny breaks. Take frequent, five second breaks. Just lean back, stretch, and take a deep breath at least every 15 minutes. In addition, get up and walk around every half hour or so. You will probably find that you get more done, and feel better, too.
- Get medical care for symptoms.

How to Adjust Your Equipment for a Better “Fit”

- Make your chair and foot controls support your body. If you can adjust your equipment for a comfortable position, many injuries can be prevented.
- Adjustable chairs are needed to do this right. If your chair is not adjustable, you still may be able to make a few of these changes.
- Team up with a buddy. Help each other to adjust your chairs and other equipment. It’s easy to see another person’s position. It’s hard to see your own!
 1. Check the chair seat tilt. The seat should be level, or tilted forward (higher in the back) if you prefer.
 2. Adjust the chair seat height for the comfort of your wrists, arms, neck and shoulders.
 - Wrists should be straight
 - Elbows close to your body
 - Shoulders relaxed
 - Head not bent over too far
 3. Next, support your feet for the comfort of your legs and back.
 - Foot controls should be at a comfortable height and distance. Have them adjusted or altered.
 - Feet that are not on a foot control can be raised using a foot rest.



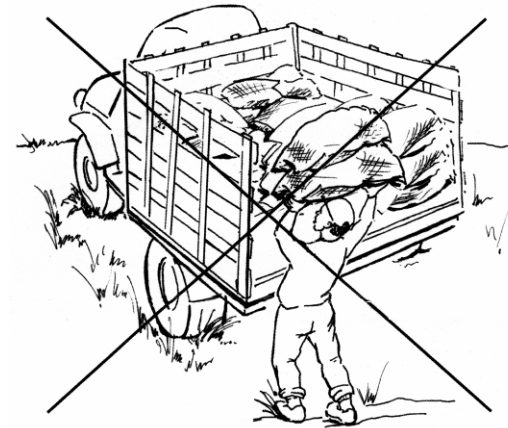
4. Move your hips back in the chair.
5. Adjust the back rest to support your lower back.
6. Adjust or pad the knee control.

You may hurt your back when you:

Repeat a certain type of work, like bending, twisting and stooping.



Carry too much weight.



Reach or stretch in awkward positions to do work.



This is what you may feel if you have hurt your back:

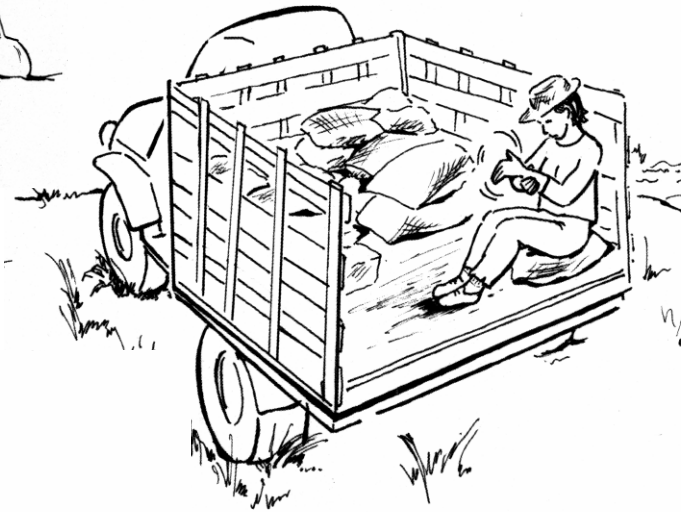
Pain



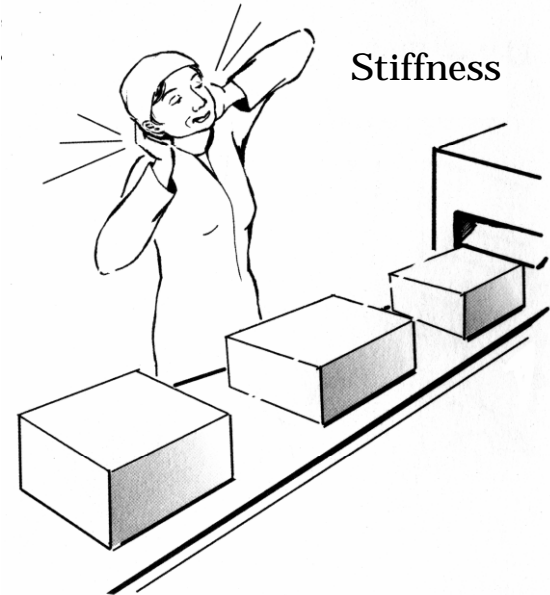
Numbness



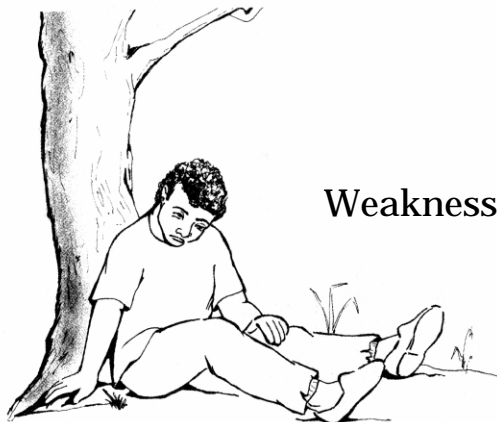
Tingling



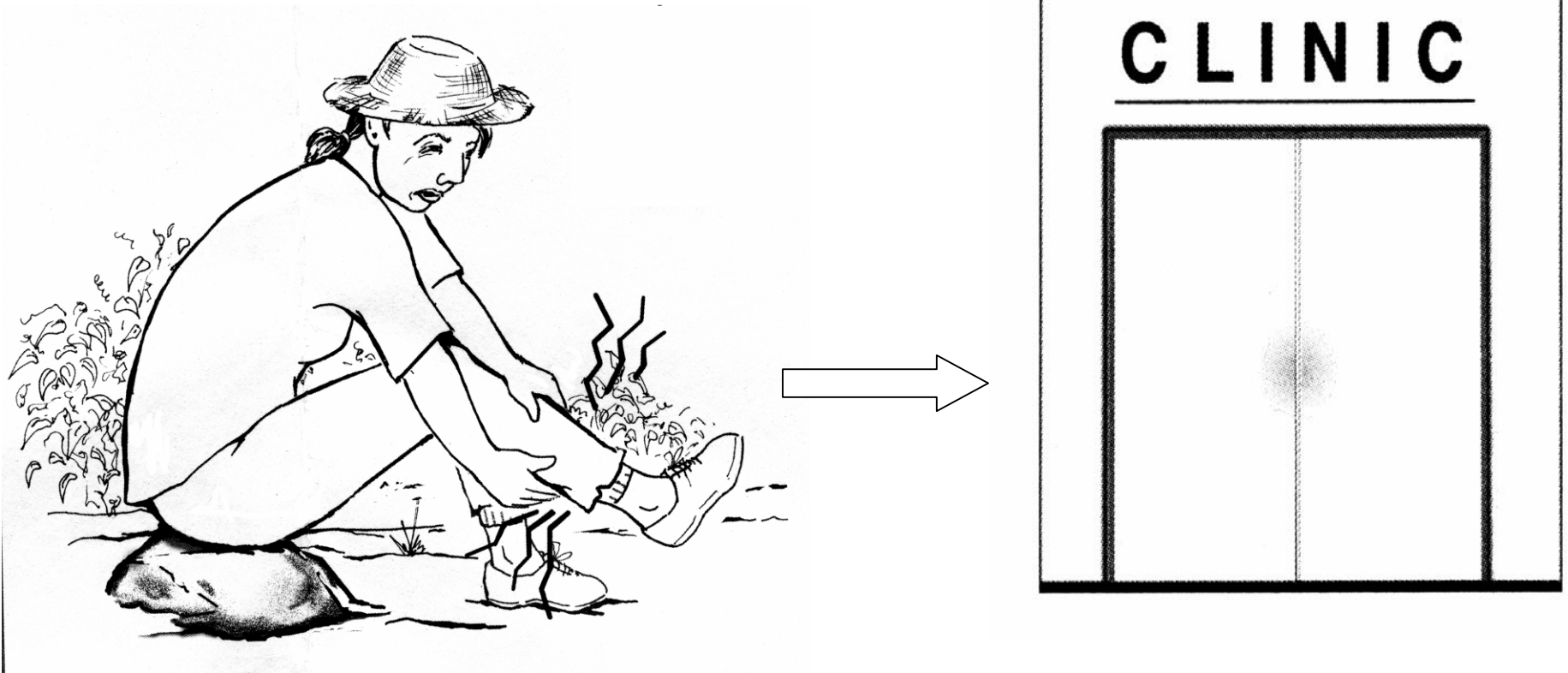
Stiffness



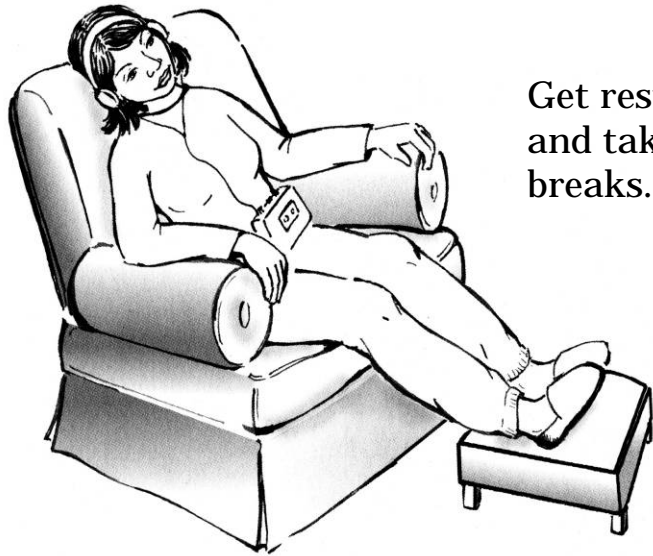
Weakness



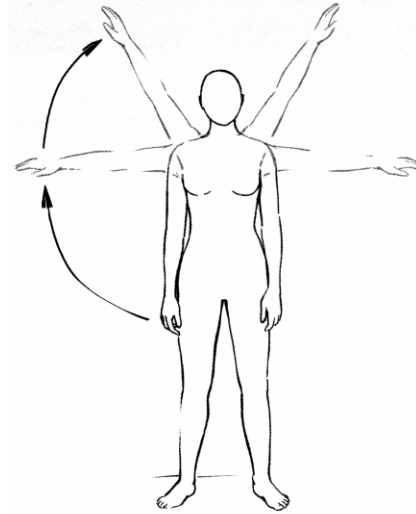
If you feel severe pain, numbness, or tingling going down your leg, see a doctor right away.



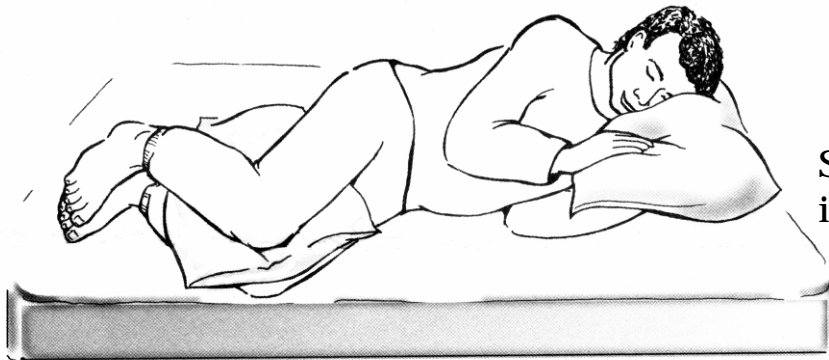
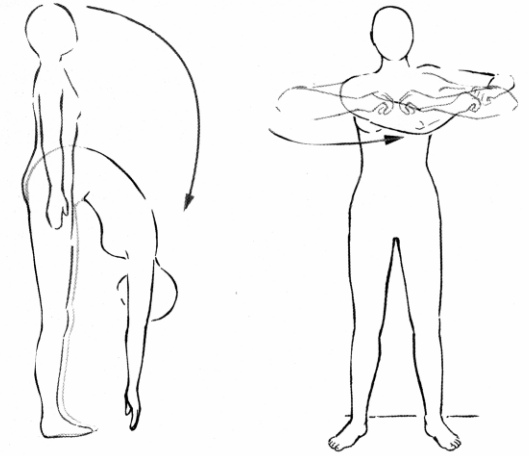
To help yourself or prevent back pain:



Get rest and take breaks.

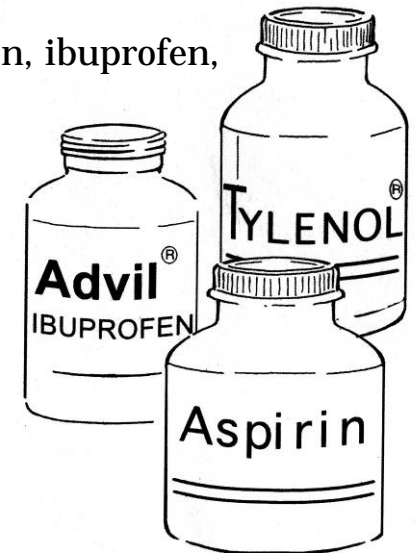


Do stretch exercises.



Sleep on side with pillow in between legs.

Take aspirin, ibuprofen, or tylenol.



Source: National Center for Farmworker Health, Inc.

Ergonomics and Stress

Equipment: flashlight, tape measure

<u>OBSERVE OR MEASURE</u>		
Ergonomics		
Choose three different machines or jobs. Look for ergonomic risk factors:		
a. repetition	c. long duration	e. vibration
b. force	d. awkward posture	f. cold temperature
Machine/Area	Risk Factors Present (a, b, c, d, e or f)	Possible Controls
1.		
2.		
3.		
<u>ASK WORKERS</u>		
Question	Answer/Comments	
4. Have employees received any training regarding ergonomics?	" Yes " No	
5. Does any of your work causes you pain?	" Yes Describe: " No	
6. What changes would help?	" Yes Describe " No	

ASK SUPERVISORS OR MANAGERS		
7. Is there a written ergonomics controls program?		
8. Have ergonomic evaluations been performed for any of the work tasks?	" Yes " No	If so which area and which tasks:
Social stressors at work		
Ask workers about the following problems.		
a. mandatory overtime	c. abusive supervisors	e. overcrowding
b. high production quotas	d. harassment (sexual or verbal)	
Work Area	Problem Types (a, b, c, d, or e)	Description/Number of employee affected
9.		
10.		
11.		
ASK SUPERVISORS OR MANAGERS		
Question	Answer/Comments	
12. Have employees received any training regarding ergonomics?	" Yes " No	When:
13. Is there a procedure for workers to report problems with work schedules, procedure quotas, supervisors?	" Yes " No	Describe
14. Who can workers expect to resolve their problems?	Describe:	

Ask management for the following documents:	Are these documents available?
15. Written ergonomics control program	" Yes " No
16. Records of hazard correction	" Yes " No
17. Records of ergonomic evaluations of specific job tasks	" Yes " No
18. Records of employee training: ergonomic hazards	" Yes " No
19. Hazard reporting procedures	" Yes " No

