

Soft tissue injury prevention



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Soft tissue injury prevention



Objectives

- Provide a proactive awareness program
- Recognize the risk factors
- Reduce the occurrence of soft tissue injuries
- Focus on work activities
- Provide practical and adaptable work practices
- Identify methods/procedures to help develop programs to control/minimize soft tissue injuries in your workplace

Soft tissue injury prevention



- What is soft tissue injury?
- How do they occur?
- How to avoid them?



Soft tissue injuries



- Definition:
 - Injuries/Illnesses to the body that do not involve skeletal damage, cardiovascular damage, etc.
 - Soft-tissue injuries are damage to ligaments, tendons and muscles
 - May result from activities that are common to work and non-work activities
 - Sudden vs. long-term exposure

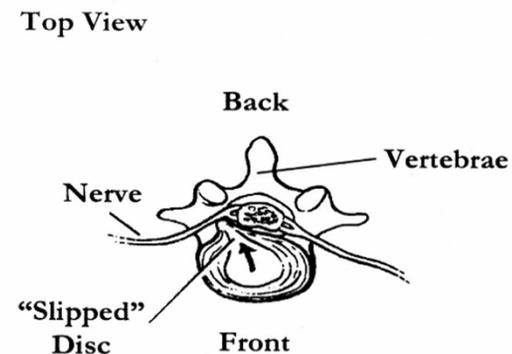
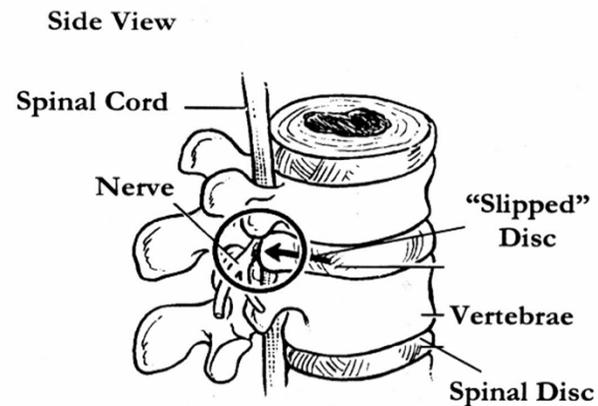
Spine

- Spine is held together by muscles, tendons and ligaments
- Tendons connect muscle to bone
- Ligaments connect bone to bone



Intervertebral discs

- Intervertebral discs separate each vertebrae and act as cushions to absorb the shock of our movements.



Common types of soft tissue injuries



- Muscular
 - Myalgia
 - Sore muscles
 - Strains
 - Stretch, partial or complete tear
 - Spasms
 - Involuntary muscle reaction from an injury
- Neurological
 - Double Crush Syndrome
 - Pinched nerve
 - Cubital Tunnel Syndrome
 - Pressure on the ulnar nerve as it passes through the cubital tunnel in the elbow
 - Sciatica
 - Pain radiating from the hip and down the leg

Failures of the human machine

Common types of soft tissue injuries



- Strains
- Sore Muscles
- Spasms
- Pinched Nerves
- Tendonitis
- Bursitis
- Intervertebral disc damage
- Carpal Tunnel
- Sciatica



Injuries and illnesses



Work related musculoskeletal disorder

- Occurs over weeks, months, years
- A chronic condition
- Damage to muscles, tendons, nerves & ligaments
- Results in abnormal conditions
 - Unable to grasp heavy items
 - Unable to reach to comb the hair
 - Unable to open bottles or jars

Symptoms of disorders

- Loss of grip strength
- Reduced range of arm motion
- Discomfort in the arm and hand at night
- Dull pain, swelling, pain when moved
- Localized tenderness
- Numbness and tingling in the hands & fingers and paling of the fingers

Consequences of illnesses & injuries



- Pain and suffering
- Limits ability to perform personal activities
- Potential for permanent disabilities
- Reduced productivity & increased errors
- Increased costs

The worker, the employee, the person



Soft tissue injury - risk factors



- Personal – physiological and psychosocial
- Occupational - physical

Psychological/psychosocial factors



- Stress
 - Many different trigger factors affect individuals differently
 - Marital, legal, financial
- Job security
 - What will I do if I lose my job?
- Happiness
 - Job satisfaction
 - Marital/family

Costs of illnesses & injuries

Zurich review of lost time cases

- 143,000 overexertion/musculoskeletal cases
- Deductibles as high as \$250,000

Average lost time case: \$17,000

- How many bags of seed/wood planters would you need to ship at 10% return to break even?

Effect on profits or budgets?

Effect on employees?

How Do Insurance Losses Impact A Company's Business



THE ICEBERG

\$afety Pays
OSHA, 1996

Do You Know How Much Accidents Are Really Costing Your Business?

Injuries alone cost U.S. businesses over \$110 billion in 1993! And that doesn't include occupational illnesses which cost many times more!

Surprised? Well, let's take a closer look at the impact of accidents on companies' profits and sales.

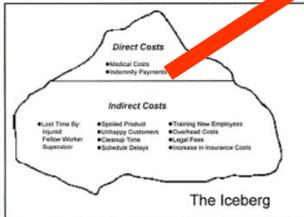
To pay for an accident with a total cost of \$500:

- A soft drink bottler would have to bottle and sell over 61,000 cans of soda.
- A food packer would have to can and sell over 235,000 cans of corn.
- A bakery would have to bake and sell over 235,000 donuts.
- A contractor would have to pour and finish 3,000 square feet of concrete.
- A ready-mix company would have to deliver 20 truckloads of concrete.
- A paving contractor must lay 900 feet of two-lane asphalt road.

Shocked? We, at OSHA, were too. The costs of accidents can impact a company's profitability. Included is a worksheet to help you assess the financial impact of an injury or illness at your company.

The Direct and Indirect Costs of Accidents

Accidents are more expensive than many of us realize. Why? Because there are lots of hidden costs.



Some are obvious - your workers' compensation claims cover medical costs and indemnity payments for an injured or ill worker. These are the **direct costs** of accidents.

But what about the costs to train and compensate a replacement worker, repair damaged property, investigate the accident and implement corrective action? Even less

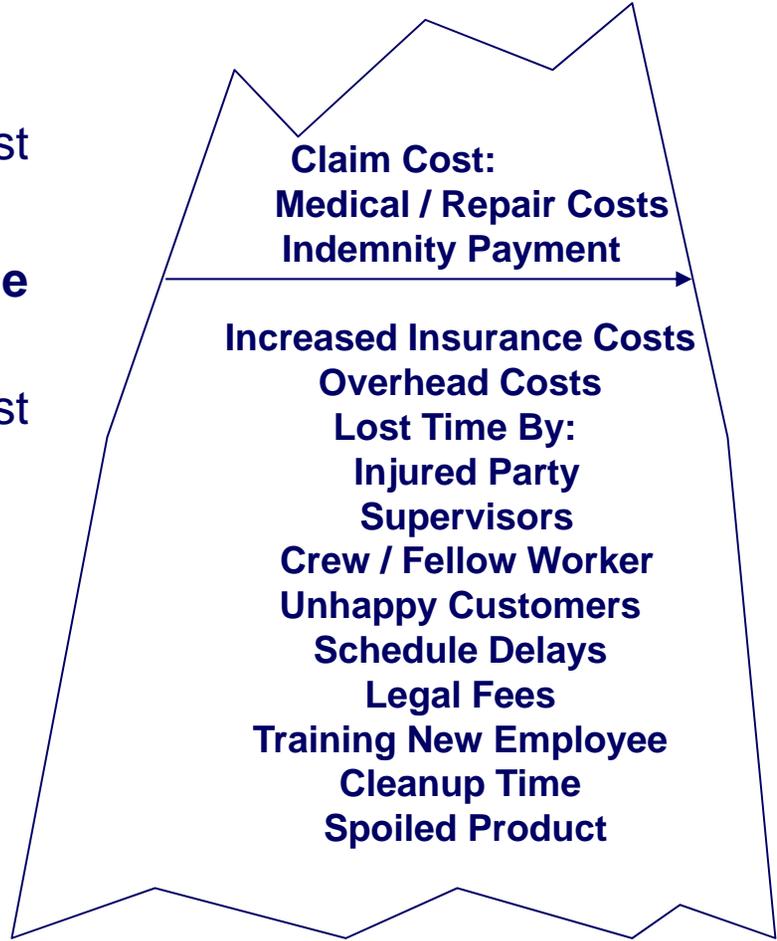
apparent are the costs related to schedule delays, added administrative time, and lower morale, increased absenteeism, and poorer customer relations. These are the **indirect costs** and like the bulk of the iceberg, are buried below the surface.

Studies show that the ratio of indirect costs to direct costs vary widely, from a high of 20:1 to a low of 1:1. We've taken a conservative approach that says that the lower the direct costs of an accident, the higher the ratio of indirect to direct costs.

Direct cost of claim	Ratio of indirect to direct costs
\$0 - 2,999	4.5
3,000 - 4,999	1.6
5,000 - 9,999	1.2
10,000 or more	1.1

Source: Business Roundtable, 1982

Direct Cost
Water Line
Indirect Cost



Splints and braces

Misuse can cause damage to the body

- Muscle atrophy
- Increased cardiovascular stress
- Increased blood pressure
- “Superman effect”

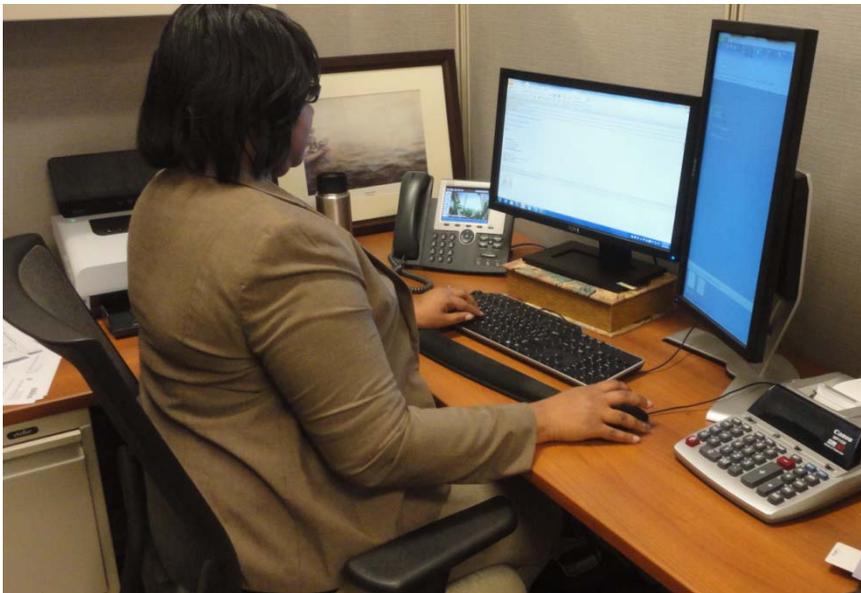
Use splints and braces only at the direction of a physician



Occupational risk factors



- Occupational
 - Repeated motions



Occupational risk factors



- Awkward postures
 - Tying rebar, loading pallets, etc.
- Extreme forces
 - Pushing, pulling, overexertion, etc.



Occupational risk factors



- Mechanical stress
 - Kneeling on hard surface
 - Carrying heavy items on the body



- Prolonged vibration
- Temperature extremes

Job performance issues - task design

Points to consider



- Who does what and for how long?
 - Postures
 - Reaching forward
 - Working below knuckle height
 - Forces
 - Lifting >30lbs.
 - Heavy grip forces
 - Repetition
 - Continuous motions
 - Hammering, typing, etc.



Job performance issues - task design

Points to consider



- Rate, duration and recovery
- Substitution/mechanization
- Breaks/job rotation
- Static vs. dynamic muscle activity



Job performance issues - work environment planning items to consider



- Manual material handling
- Awkward postures
- Mechanical stress



Job performance issues - work environment planning items to consider



- PPE
 - Gloves Proper fit –right glove for the job.
 - Knee and shoulder pads
 - Footwear
 - Insoles
 - Back belts
- NIOSH Lifting Guide
- Push vs. pull
- Equipment selection



Opportunities in construction



Opportunities in construction



Opportunities in manufacturing



Good work procedure

- Pallet is elevated by forklift
- Work is done at waist height
- Less stress on the back



Real-life solutions



Good work procedure

- Pallet is elevated by forklift
- Work is done at waist height

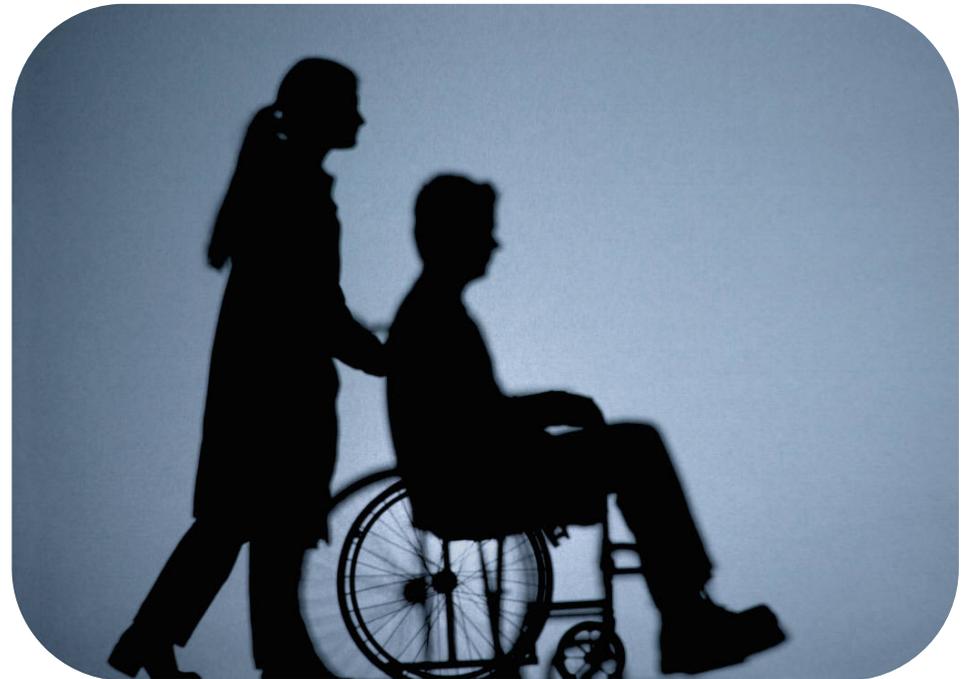
Opportunities in office settings



Medical/rehabilitation personnel information



- Job descriptions
- Return to work protocols
- Modified duty defined
- Modified job activities
- Reduced risk factors
- Medical treatment



Manual material handling



- Overexertion illnesses/injuries (1/3 to 1/2 of all cases)
- One third of workers exposed to lifting hazards
- One quarter of injuries relate to material handling

Material handling techniques



- Keep the curve in the low back
- Bend the knees (if possible)
- Keep the lift between the knees and shoulders
- Request assistance
- Use equipment for all drums and heavy bags, boxes, other items

Material handling

Bending at the waist can increase stresses on the spine, even when not lifting

- 45-degree or more bend
 - Increases injury risk 20- to 50-times that of upright work
- Twisting increases the risk for back injuries
- Bend knees and use the legs & knees as possible
- Keep the spine aligned (maintain the curve in the lower back)
- Use two people or equipment for really heavy items



Material handling



- Reaching up
 - Stress on shoulders

Awkward shoulder postures

- 10-times greater risk for shoulder injuries when working above shoulder height



Material handling



- Extended reaching
- Twisting
- Working from the floor
- Stress on the spine

Ergonomics awareness



Fit the work to the worker

- Make it comfortable

Design things within people's physical abilities (reach, strength, height)

- We can't stretch people out to make them taller, or crunch them to make them shorter

Provide the appropriate tools & materials

- Make certain people know how to use them

Plan the job tasks

- Knee pads
- Lift assist devices
- Proper tools

Awkward postures



- Forward bending
- Sideways bending
- Extended reaches
- Rotated forearm postures
- Twisting

Awkward postures



- Awkward shoulder/arm postures
- Increased risk for damage
- Awkward back posture
- Material handling
- Stretching can reduce stress on the body

Awkward postures



- Workstation height is okay for smaller employees
- Taller workers may have to bend forward
- Force exertion from hand tool use during rework

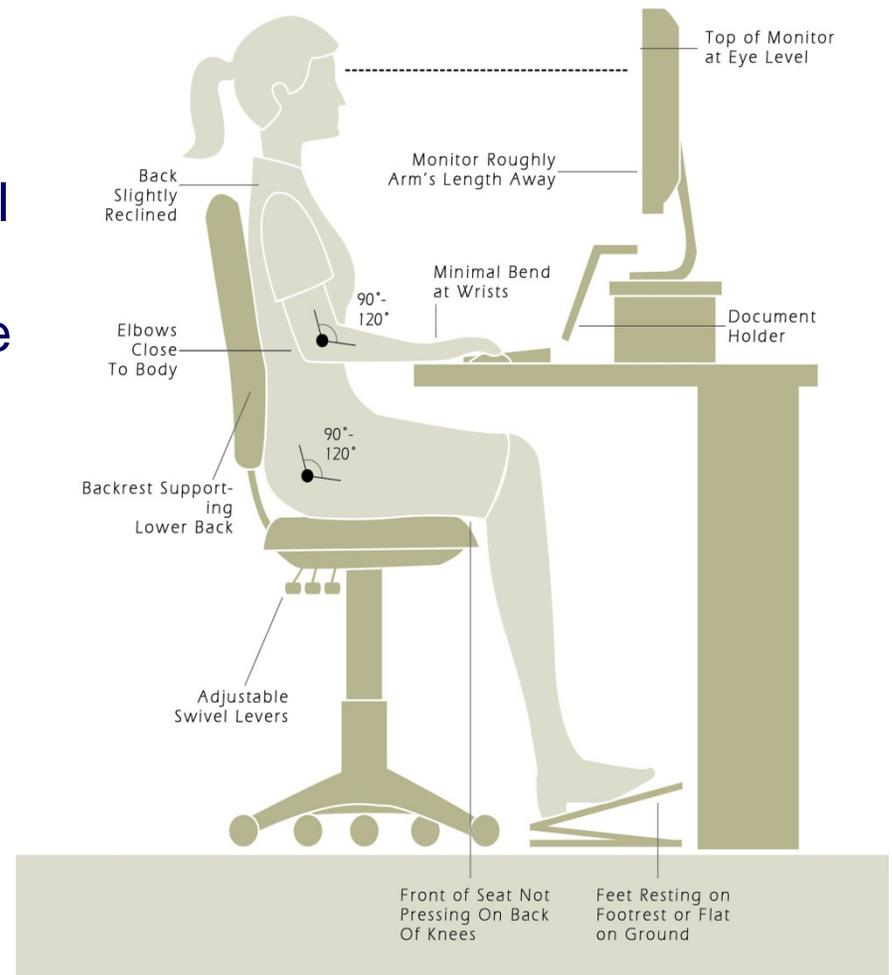
Seated work

- Backrest should be provided
- Chair should be padded
- Shoulders should be relaxed
- Elbows should be about 90-degrees
- Wrists should be straight (no wrinkles)
- Knees should be about 90-degrees
- Feet should be supported by floor or footrest
- Clearance should be available for legs, knees, feet underneath work surface



Seated work

- **Computer use**
 - Align keyboard & monitor
 - Top of screen just below eye level
 - Mouse next to keyboard
 - Use full forearm motion to operate mouse
 - Do not rest wrists when typing



Standing work



Floor surface	Quality for standing
Metal grate	Poor
Concrete	Bad
Plastic/cork	Good
Rubber mat or carpet	Best

Standing work



Anti-fatigue mats/shoe inserts

- Make the feet/legs move
- Reduced pooling of blood in the lower legs
- Mats need to be big enough

Footrests at standing workstations

- Shift body position
- Reduce fatigue
- Improve productivity

Non-occupational risk factors



- Age –muscle tone, hearing, vision, response time
- Hobbies—hand/wrist intensive
- Athletic activities –different effects
- Tobacco use –lowers circulation
- Hormone changes –underactive/overactive
- Garden/yard/home improvement work—hard work with time pressures

Reporting symptoms



Early reporting of chronic work-related symptoms is important

- Reduces seriousness of injury or illness
- Reduces time required to treat symptoms
- Improves the chance of treatment success
- Allows improvements to be made to work area

Why should we stretch?



Daily work activities typically involve:

- A lot of physically intense labor
- Often performed by workers who are not in peak physical condition
- “Industrial athletes” – a pro athlete would never “go to work” without stretching first – other workers performing physical tasks shouldn’t either
- Aging workforce is becoming an issue across all industries
- Pre-work stretching prepares the body for physical activity



Benefits of stretching: employee



Employee

- Flexibility/agility/balance
- Range of motion/strength
- Blood circulation
- Posture
- Stress relief
- Injury prevention



Benefits of stretching: employer

Employer

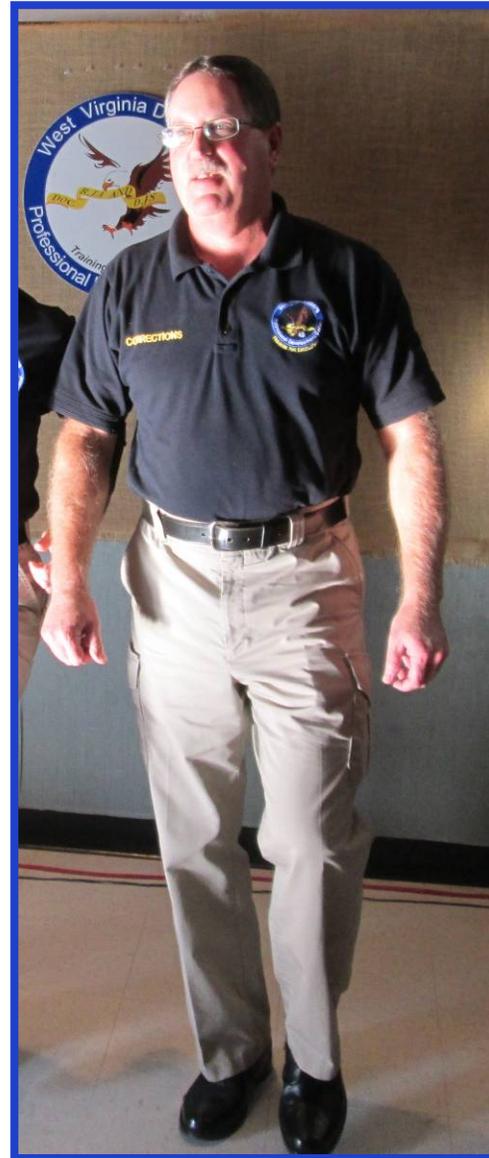
- Avoids disruption of absenteeism
- Stress reduction
- Promotes managerial interaction (RM, H&S, HR)
- Eases regulatory compliance (ADA, FMLA)
- Morale
- Reduced workers' compensation costs

Productivity

- Stabilizes workforce availability
- Reduced costs (Lost work days)
- Increased profitability

Stretching Essentials

- Target specific (major) muscle groups
- Warm-up first
- Hold each stretch for required time
- Do not bounce
- Focus on pain-free stretch
- Relax and breathe freely



Final thoughts



- Plan job tasks
- Keep lifts between the knees and shoulders
- Keep shoulders relaxed, elbows about 90 degrees and wrists straight
- Avoid bending or twisting the back or neck
- Avoid making extended reaches
- Use footrests, anti-fatigue mats and shoe inserts
- Stretch out at the beginning of the day and after slow periods and breaks
- Use the correct tools and equipment