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**

**Claim Cost:**
- Medical / Repair Costs
- Indemnity Payment
- Increased Insurance Costs
- Overhead Costs
- Lost Time By:
  - Injured Party
  - Supervisors
  - Crew / Fellow Worker
- Unhappy Customers
- Schedule Delays
- Legal Fees
- Training New Employee
- Cleanup Time
- Spoiled Product

**Direct Cost**
- Water Line

**Indirect Cost**
- Lost Time By:
  - Injured Party
  - Supervisors
  - Crew / Fellow Worker
  - Unhappy Customers
  - Schedule Delays
  - Legal Fees
  - Training New Employee
  - Cleanup Time
  - Spoiled Product

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

Injuries alone cost U.S. businesses over $110 billion in 1989! And that doesn’t include occupational illnesses which cost many times more!

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**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, 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.

<table>
<thead>
<tr>
<th>Direct cost of claims</th>
<th>Ratio of indirect to direct costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0 - $5,999</td>
<td>4.6</td>
</tr>
<tr>
<td>$6,000 - $9,999</td>
<td>1.6</td>
</tr>
<tr>
<td>$10,000 to $19,999</td>
<td>1.2</td>
</tr>
<tr>
<td>10,000 or more</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Source: Business Roundtable, 1982
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

<table>
<thead>
<tr>
<th>Floor surface</th>
<th>Quality for standing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal grate</td>
<td>Poor</td>
</tr>
<tr>
<td>Concrete</td>
<td>Bad</td>
</tr>
<tr>
<td>Plastic/cork</td>
<td>Good</td>
</tr>
<tr>
<td>Rubber mat or carpet</td>
<td>Best</td>
</tr>
</tbody>
</table>
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