Strain & Sprain Injuries: Prevention Techniques

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Sprains and strains by event or exposure and part of body, 2008

Sprains and strains made up nearly 4 out of 10 injuries. Overexertion was a common event causing this. Most of these cases affected the back.

Source: Bureau of Labor Statistics, U.S. Department of Labor, Survey of Occupational Injuries and Illnesses, cases involving days away from work. Chart 12

Median days away from work and incidence rate due to injuries and illnesses by nature, 2008

In 2008, fractures and carpal tunnel syndrome were the most severe natures of injury and illness, with median days of 29 days away from work to recover. Amputations had 146 days away from work to recover.

Source: Bureau of Labor Statistics, U.S. Department of Labor, Survey of Occupational Injuries and Illnesses, cases involving days away from work. Chart 13
What is a sprain?

A sprain is a stretch and/or tear of a ligament, the fibrous band of connective tissue that joins the end of one bone with another. Ligaments stabilize and support the body's joints. For example, ligaments in the knee connect the upper leg with the lower leg, enabling people to walk and run.
What is a strain?

- A strain is a twist, pull and/or tear of a muscle and/or tendon. Tendons are fibrous cords of tissue that attach muscles to bone.
What is muscle soreness?

Sore muscles result primarily from micro-tears in the muscles from muscle overexertion.
What Causes Sprains?

- Direct or indirect trauma
- Knocks a joint out of position, and overstretches, in severe cases, ruptures the supporting ligaments

What are the signs of a sprain?

- Pain
- Bruising
- Swelling
- Inflammation
- Feel a “pop” or tear in joint
- Some instability or loss of use
What Causes Strains?

- Overuse of muscles & tendons
- Inadequate rest breaks
- Direct blow to body
- Overstretching
- Excessive muscle contraction

What are the signs of a strain?

- Pain
- Muscle spasm
- Weakness
- Swelling
- Inflammation
- Cramping
- Can incapacitate a person
Poor Lifting
Effect on Back

1100 lbs.

22"

2"

100 lbs.

1200 lbs.

Product

50 lbs.

650 lbs.

WCF
Proper Lifting

- Bend your knees
- Test the Weight
- Get a Firm Grip
- “HUG” the Load
- Keep it Straight

Knee Sprain & Strain

- Not always told which ligament is injured
- Could be ACL, MCL, or PCL
- Some feel a “pop”
- Knee “gives out”
- Blow to the knee
Questions for the Doctor

- Where is the sprain located and how severe is it?
- What treatment do you recommend?
- What rehabilitation program do you recommend?
- Will surgery be recommended?
- Can conservative treatment be tried first?
- Will the knee ligaments be permanently weak or susceptible to injury?
Treatment for knee injury

- Ice
- Anti-inflammatory meds
- Cortisone injections
- Surgery in worst case

Shoulder Sprain & Strain

- Tearing can occur
- Weakness in a shoulder
- Inability to raise an arm as high as other
- Rotator cuff tear
- Age = Rheumatoid Arthritis
Causes of Shoulder Injuries

- Falls
- Not warming up muscles
- Underuse
- Lack of exercise
- Impingement (like CTD)
- Instability

Treatment

- RICE
- Rest body part
- Ice: 20 min on 20 min off for 24-48 hrs
- Compression
- Elevation
- Crutches & exercises in more severe cases
Alternative Treatment

- Vitamin C & Bioflavonoids (antioxidant)
- Whole grain, fresh fruit, vegetables
- Tumeric & bromelain in pineapple (anti-inflammatory)
- Arnica & Ruta herbs

Accident Prevention Program

- Management Commitment
- Assign Responsibility
- Hazard ID & Control
- Employee & Supervisor Training
- Workplace Conditioning
- Medical Assistance & Emergencies
- Return to Work
- Incident Investigation & Recordkeeping
Strain & Strain Prevention Program

- Analyze tasks to find body parts at most risk
- Write & use functional job descriptions
- Test if employee can do essential job functions
- Take steps to reduce risk by:
  - Work/task design changes
  - Using mechanical devices
  - Train employees in preventive measures

Strain & Sprain Prevention

- Individuals performing work tasks:
  - Receive instruction in safe task execution
  - Have muscle groups and joints prepared for work activity
Prevalence of Cumulative Trauma Syndrome (CTS) by Body Mass

Body Mass Facts

- 55% of American workforce is overweight or obese
- The average American is 7 pounds heavier than they were 10 years ago
- Obesity is the 2nd leading preventable cause of death in US after smoking, responsible for 300,000 deaths per year
Prevalence of Cumulative Trauma Syndrome (CTS) by Exercise Level

Prevention Tips

- Participate in a conditioning program to build muscle strength
- Do stretching exercises daily
- Always wear properly fitting shoes
- Nourish your muscles by eating a well-balanced diet
- Warm up before any moderate to strenuous activity (work, sports, practices, etc.)
- Use or wear protective equipment appropriate for that activity
Predisposing Factors for Strain

- **Muscle tightness** - Tight muscles are vulnerable to strain.
- **Muscle imbalance** - Antagonistic muscles work together, don’t want one strong than another
- **Poor conditioning** – Weak muscles are less able to cope with the stress of exercise and more likely to be injured.

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Predisposing Factors for Strain

- **Muscle fatigue** - Reduces the energy-absorbing capabilities of muscle
- **Insufficient warm-up** - A proper warm-up increases range of motion and reduces stiffness.
Workplace Warm-up

- Workplace exercise programs have:
- Reduced costs of healthcare
- Reduce absenteeism
- Reduce injury rates
- Increase performance and productivity

Precautions:

- Warm up before any moderate to strenuous activity. This will help increase your speed and endurance.

- Stretch slowly and gradually, holding each stretch to give the muscle time to respond and lengthen.
WARM-UP EXERCISES

- **Warm-up**- prepares your body for physical exertion.
- Athletes warm up to improve performance and avoid injury.
- Eating a meal bring blood from the muscles to the internal organs.
- You are especially injury-prone *right after meals!*

**Exercise & Activities**

**Proper exercise means**
- Improved health
- Stronger body
- Improved endurance
- Reduced stress
- Better range of motion

**No exercise means**
- Easily fatigued
- Muscles weaken
- Easily injured from light activity
- No endurance
- Less resistance to illness
Regular Stretching

- Reduces muscle tension and stress
- Permits easier movement.
- Increases joint range of motion and lubrication.
- Decreases the risk of a cumulative trauma disorder

Correct Stretching

- Relaxed, slow and frequent.
- No bouncing or stretching to the point of pain.
- Hold for 3-5 relaxing breaths
- Do both sides
Knee & Balance Handout

Hamstring stretch
Warm up

- All stretching is ineffective if it is performed when the body is cold, so begin with exercises to warm the body
- The total duration of the stretch should be about 20 seconds.

An Effective Program Will:

- Identify muscles/tendons at most risk
- Exercises target at risk groups
- Survey employees for needed modifications to exercise
- Have group leaders to instruct how to do exercises & in what order
Stretch & Flex Exercises

- http://www.westvalley.edu/stretch/default.html
- http://k2.kirtland.cc.mi.us/~balbachl/stretch.htm

Lack of fitness is more of a risk factor than smoking, high blood pressure and elevated cholesterol for cardiovascular disease and premature death.

C. Everett Koop, former US Surgeon General
Summary

- Look at hazards
- Remove hazards where possible
- Give employees tools to get job done
- Ensure employees are fit for the job
- Encourage exercise
- Develop a wellness program