Building Your Quality of Life

ZURICH

Soft Tissue Injury Prevention Program

What is a soft tissue Injury?
How does one occur?
How can you avoid them?

Goals and objectives

- Provide a proactive educational awareness program
- Reduce the occurrence of soft tissue injuries
- Focus on construction activities
- Provide practical, usable resources
- Identify methods/procedures to help develop programs to control/minimize soft tissue injuries in your workplace

Soft tissue injuries

Definition

- Injuries/Illnesses to the body that do not involve skeletal damage, cardiovascular damage, etc.
- Damage to ligaments, tendons and muscles
- May result from activities that are common to work and non-work activities

The Body: Soft Tissue of the Human Machine

- Muscles
  - The engine
- Nerves
  - Electrical system
- Connective tissue
  - Cables and rigging
- Skin
  - The cab

The Body: Soft Tissue of the Human Machine

- Ligaments
  - Boom pins
- Tendons
  - Load cable
- Fascia
  - Connectivity to the load

Failures of the human machine

Common types of soft tissue injuries

- Muscular
- Myalgia
  - Sore muscles
- Strains
  - Stretch, partial or compete tear
- Spasms
  - Involuntary muscle reaction from an injury

Failures of the human machine

Common types of soft tissue injuries

- Neurological (related to the nervous system)
- Carpal Tunnel Syndrome
- 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

- Vascular
  - Affects the circulatory system
- Thoracic Outlet Syndrome
  - Related to overexertion, sudden stretching, use of muscles before they are warmed
- Reynaud's Syndrome
  - Degeneration through age, improper posture, poor planning
- Consider all that can be:
  - Torn, pulled
  - Strained and overextended

Failures of the human machine

Common types of soft tissue injuries

- Connective Tissue
- Strains
- Tendonitis
- Tenosynovitis
- DeQuervain's disease
- Bursitis
- Intervertebral disc damage
- Back

Soft tissue injury risk factors

Individual response to stimulus

- Individual responses differ greatly to every risk factor noted

Soft tissue injury risk factors

- Personal
- Occupational
- Repeated motions
  - Troweling concrete
  - Others?

Soft tissue injury risk factors

- Awkward postures
  - Tying rebar
  - Others?
- Extreme forces
  - Pushing
  - Pulling
  - Overexertion
  - Others?

Soft tissue injury risk factors

- Mechanical stress
  - Kneeling on hard surfaces
  - Others?

Soft tissue injury risk factors

- Prolonged vibration
- Temperature extremes

Physiological factors

- Obesity
- Diabetes
- Hormonal imbalances
- Circulatory disorders
- Arthritis, bursitis, other joint conditions
- Wrist size and shape
- Gender
- Smoking
- Alcohol consumption
- Poor physical conditioning
- Age

Physiological/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

Measure to control and minimize risk of occurrence

- Risk indicators:
  - Injury data
    - History
  - Surveys and questionnaires
    - More proactive than history

Measure to control and minimize risk of occurrence

- Performance indicators
  - Absenteeism, rework, quality, productivity, etc.
- Observations and communication

Job performance issues: Task design point to consider

- Who does what and for how long?
- Postures
  - Rodbusters
  - Concrete finishers
- Forces
  - Concrete vibrator
  - Pump hose
- Repetition
  - Raking concrete
  - Hammering

Job performance issues: Task design point to consider

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

Static vs. dynamic muscle activity

- Standing while holding a concrete vibrator on your shoulder for long periods of time is an example of static muscle stress

Static vs. dynamic muscle activity

- Troweling concrete during a concrete deck pour is an example of dynamic muscle stress

Job performance issues: Work area planning points to consider

- Sit vs. stand
- Work surface height
- Reach zones/work envelopes
- Visual zones
- Sharp edges/hard surfaces
- Floor mats/insoles
- Shelving

Job performance issues: Work environment planning points to consider

- Housekeeping
- Lighting
  - Amount
  - Direct vs. non-direct
- Temperature
- Noise
- Vibration
- Awkward postures
- Mechanical stress

Job performance issues: Work environment planning points to consider

- Personal Protective Equipment (PPE)
  - Clothing
  - Footwear
  - Gloves
  - Tool use
- Manual material handling guidelines
- Lifting techniques
  - NIOSH work practices guide for manual lifting
- Push vs. pull
- Equipment selection

Incident management

- Immediate/thorough injury/illness investigations
- Avoid placing blame
  - Find the root cause
  - Look for corrective actions
  - Share the findings
- Focus on future prevention

Medical/rehabilitation personnel information

- Job descriptions
- Return-to-work protocols and modified duty
- Modified job activities
- Reducing risk factors
- Control factors adequately addressed
- Oversight and evaluation
- Medical treatment

Energy/metabolism

- What we eat affects our energy levels
- Can affect long-term health
- May contribute to avoidance of soft tissue injury

Lactic acid

- The leftovers in our body's cells when food is converted to energy
  - Build-up of lactic acid can cause muscle fatigue

Lactic acid

- Good physical conditioning minimizes the effect of lactic acid build-up
  - Regular exercise can help reduce build-up of lactic acid and may reduce muscle injuries

Length-tension curves

- The length of a muscle fiber in relation to its optimal length is a factor that rules the amount of force the muscle fiber can generate
  - How can we lengthen muscle fibers?

A case for stretching

- Muscles are often not prepared for the stresses and strains that everyday construction activities place on them
- A hard day's work will cause your muscles to contract and flex, often becoming sore

A case for stretching

- Stretching stiff and/or tired muscles balances and lengthens them, and can reduce pain and potential injury in the future.

Benefits of stretching

- Stress relief
  - Stretching relaxes tight, tense muscles that often accompany times of stress
- Enhanced coordination
  - Maintaining the full range of motion through your joints keeps you in better balance

Benefits of stretching

- Increased flexibility
  - Flexible muscles can improve your daily performance
- Improved circulation
  - Stretching increases blood flow to your muscles
- Better posture
  - Frequent stretching can help keep your muscles from tightening, allowing you to maintain proper posture

Stretching policies/programs

- Mandatory vs. optional
- Pre/post-work vs. pre/post-task

Stretching policies/programs

- Types of intervention
  - Morning stretch
  - Post workday stretch
  - Pre/post-task stretch
  - Exercise physiologist monitored program
  - Chiropractor monitored program

Stretching routines

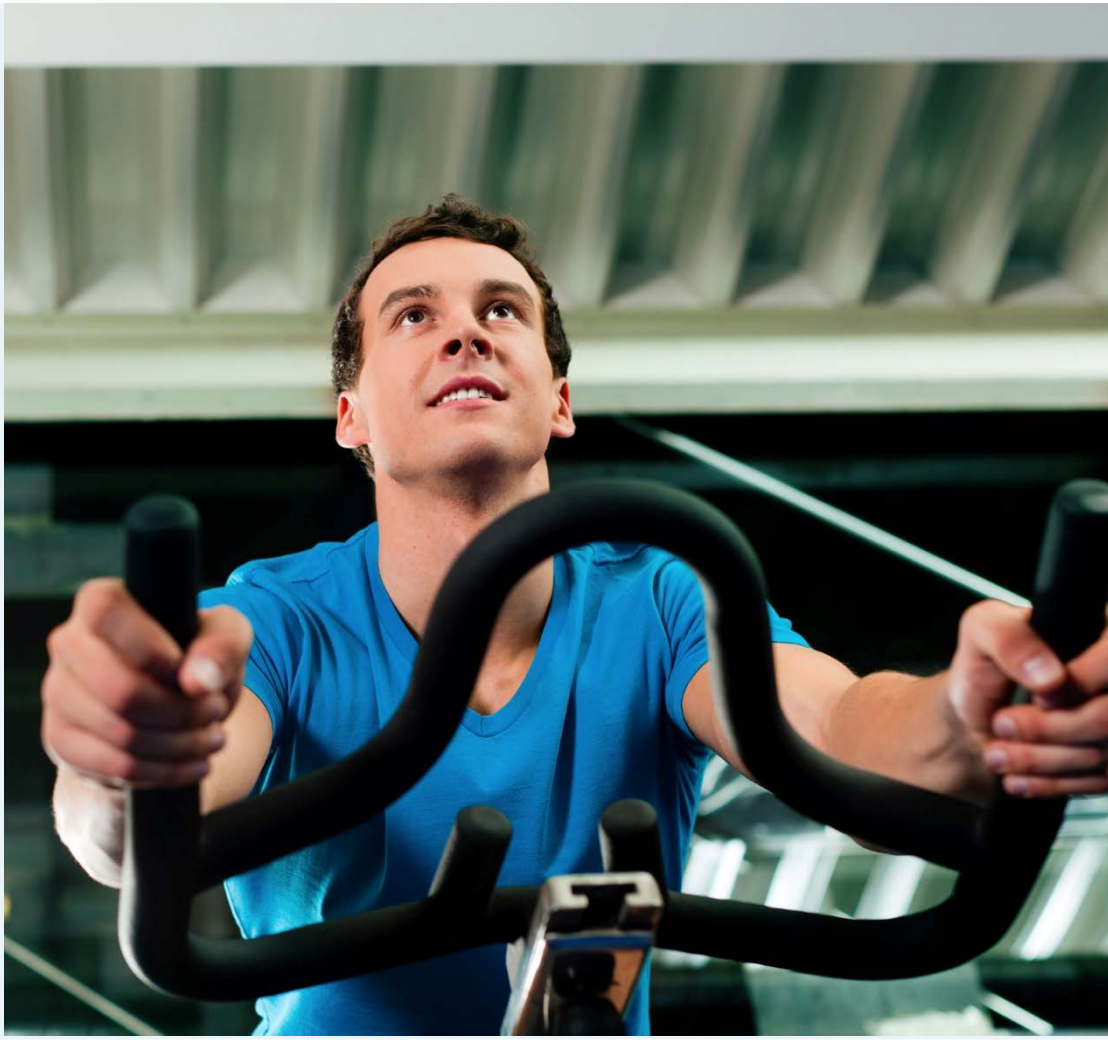
- Warm up first
  - Stretching muscles when they’re cold increases your risk of pulled muscles
- Static vs. dynamic stretching
- Hold each stretch for at least 30 seconds
  - It takes time to lengthen tissues safely
- Don't bounce
  - Bouncing as you stretch can lead to muscle injuries

Stretching routines

- Focus on a pain-free stretch
  - If you feel pain as you stretch, you've gone too far
- Relax and breathe freely
  - Don't hold your breath while you're stretching
- Stretch before and after work
  - Light stretching after your warm-up followed by a more thorough stretching regimen after your work task is best

Wellness

- Well-balanced diet
- Avoid illegal drugs, tobacco products; and use alcohol in moderation
- Regular aerobic exercise
- Stress management
- Adequate sleep
- Commitment to leisure time



Health

- Wellness-oriented activities
- Regular medical checkups

Diet

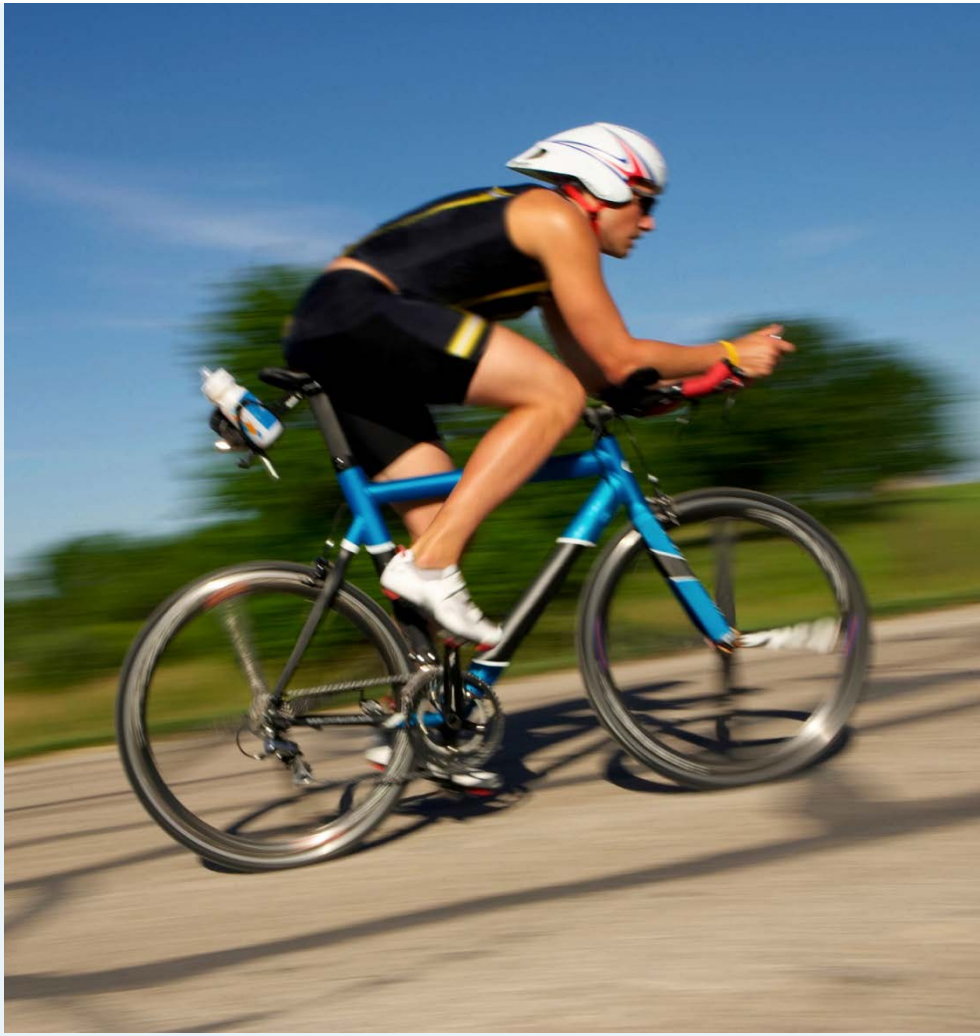
- There is no magic diet that will prevent soft tissue injuries
- However, a good balanced diet with regular exercise will probably help prevent STIs

Lifestyle choices

- Use of illegal drugs
- Excessive use of alcohol
- Use of tobacco products

Conditioning

- A strong body is an insurance policy that may help prevent disabling injuries



Strengthening and conditioning

The muscles that do the work

- Strong well-conditioned muscles allow you to remain focused on your work assignment without tiring and losing your ability to stay alert to the exposures that might cause an accident

Cardiovascular

- A good 30-40 minute walk or an hour on a bicycle will help strengthen the heart and build endurance

Industry/task-specific

- A vibratory roller operator has different exposures than a carpenter or an electrician
- Focus on muscles and muscle groups that you use and stress in your specific work/task activity

Personal protective equipment

- Back belts
  - Require training
  - Require medical counsel
- Knee pads
- Shoulder pads
- Joint braces
- Gloves
- Shoes/inserts

Think ahead and have a plan

- Evaluate personal work habits
- Reinforce where appropriate
- Modify where appropriate

Cost benefit analysis

- Human benefits
- Business benefits

Preparation for the "Construction Athlete"

- Acknowledging real life situations
- Enhancing the way they work
- Creating a safer workplace
- Education
- Increasing the longevity of muscle and joint regions

Thank you

This soft tissue injury program is intended to increase awareness of certain factors that may contribute to soft tissue injuries among construction craft workers and to suggest practices that may reduce the risk of such injuries. This program is not intended to provide specific guidance to any one construction company or for any one construction project. This program does not address the entire range of activities or conditions found in the construction industry, or suggest that other approaches to the risk of soft tissue injury do not merit equal consideration. The information that this program conveys is necessarily general in nature.

While certain practices appear to be desirable, none can guarantee that soft tissue injuries will not occur. This program does not create any obligations, or establish any specific standards or guidelines, for managing the risk of such injuries. It is not an exhaustive or complete treatment of its subject matter.

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