

Soft Tissue Injuries: Questions Every Manager Should Ask

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Introduction

According to the U.S. Bureau of Labor Statistics, soft tissue injuries including sprains and strains, back pain, carpal tunnel syndrome, hernia, and tendonitis were responsible for 31.6% of lost work days in 2004. What can managers do about these injuries and losses? Some managers accept these injuries as a cost of doing business. Other managers wonder if there is a magic bullet that will prevent these injuries. And then there are the managers who ask the right questions and take practical steps to reduce soft tissue pain, injury and losses. The goal of this session is to provide an overview of the questions that can lead to a clearer understanding of the nature, causes and prevention of soft tissue injuries... in your organization.

The questions

Here are five key questions that help occupational safety and health leaders to plan and implement effective prevention and response practices:

1. What is the scope of the problem?
2. What are the causes of the problem?
3. What technologies are available to prevent injury and reduce losses?
4. What is the current state of the problem in my organization?
5. How can I make the most valuable impact on soft tissue injuries over the next two years?

These questions may initially sound too generic and broad to be useful. However, this session will show how these questions can lead to well focused and results-oriented soft tissue injury prevention and response initiatives.

What is the scope of the problem?

This considers soft tissue injuries from the perspective of occupational safety and health leadership. How a leader views a problem greatly influences the kind and quality of solutions that are developed. When a leader asks “What is the scope of the problem?” it is useful to consider data from the following programmatic sources:

1. Injury reports and statistics.
2. Medical management.
3. Claims management.
4. Ergonomic risk factor analysis.
5. Wellness and fitness promotion.
6. Economic and human resources context

Injury reports and statistics

The reporting and statistics associated with soft tissue injuries often divides into two realms. Many safety and health professionals view the problem in terms of the number of recordable injuries. Other professionals are more focused on measures of the severity and losses associated with soft tissue injuries. The effectiveness in addressing the soft tissue pain and injury problem is often the result of what measures executive management is using to judge the performance of the Occupational Safety program and staff.

Organizations that define and measure the problem of soft tissue injuries primarily in terms of recordable injuries face two inherent biases:

1. The definition of a recordable incident focuses on the medical prescription of medication on work restrictions, and on whether the injury was work related. This can lead an organization to focus on managing the incident rather than reducing the risk. For example, an organization that is very incident focused may spend a majority of time and resources on incident and claims management.
2. If an organization has a very low incidence rate or a very small number of employee labor hours per year, a single incident can result in statistically misleading implications about the success and quality of the injury prevention program. For example, in a department or operation that has 100 employees and a current incident rate of 5.0, a single incident of back pain resulting in the prescription of pain relief medication – but no lost time or restrictions – can increase the incident rate by 20%. This can be perceived by both management and employees as a major safety failure that captures the focus of much of the available safety resources. But, when put in greater perspective, putting significant resources into this particular incident may divert resources from much more valuable safety and health efforts.

Organizations that also focus on measuring the severity and losses associated with soft tissue injuries may see the problem from a different perspective. The focus may be more on specific kinds of soft tissue injuries that result in significant disability, expensive medical treatments or critical productivity losses. This can result in maintaining a productive focus on work related risk factors – specific to the organizations operations – which have potential for costly medical treatment or long term restriction on duties.

Medical and claims management

Medical management and claims management practices have been shown to significantly impact the severity of disability and losses associated with soft tissue injuries. Consider the example of an employee who is put on work restriction for joint pain – for example shoulder pain.

First consider the data that gives perspective on medical management. Medical treatment, prescribed restrictions and prescribed rehabilitation for shoulder pain can vary significantly from one physician to the next. When you look at medical data is there consistency or chaos in treatment, restrictions and rehabilitation? Many organizations have found that improving medical management has been a key element in initially reducing medical costs, reducing lost time and preventing re-injury through rehabilitation based on the measured physical requirements of the job.

Claims management data can often reveal important information about the scope of soft tissue injuries in your organization. Continuing with our example of shoulder injury – look for clusters of similar injuries in a department or facility. Claims data can also give insight into your organization's ability to accommodate restrictions and return to work. If an organization can not accommodate the restrictions prescribed for the injury (e.g. shoulder pain) the employee may be sent home. Many studies done by insurers have shown that lost time and claims costs increase in the absence a defined and monitored return to work program.

Ergonomic risk factor analysis

Soft tissue injury risk factor recognition and risk reduction is often associated with an ergonomics evaluation. Ergonomic job evaluations can reveal patterns of high force, awkward posture or repetition/fatigue. Do you have ergonomic data that identifies jobs or tasks that have particularly high risk? Often, this data is more useful than injury report data when trying to decide how to prevent future injuries. For example, when an employee is asked how they injured their shoulder, they often identify a task that correlates with their pain becoming unbearable. The employee may have been picking up a bucket of water when their pain flared to an unbearable level. Picking up the bucket may or may not be a primary cause of a window washer's shoulder pain and injury. If ergonomic analysis shows that window washing requires reaching into the high Red Zone frequently requiring the heels of both feet to rise off the ground, this stressor may be more significant than lifting and carrying the bucket. Often shoulder injuries, and many other kinds of soft tissue injuries, often start small and then become worse over long periods of task performance and employment.

Wellness and fitness promotion

Personal fitness factors, medical conditions, and tissue damage from previous injury can also contribute to the risk of soft tissue pain and injury occurring on the job. Wellness screening and fitness testing data can often reveal individuals and groups who are at higher risk for soft tissue injuries including back injury and carpal tunnel syndrome. If your

organization has this kind of data it can be very helpful in understanding the scope of the problem.

Economic and human resources context

Economic data can also provide valuable insight into the nature of an organization's soft tissue injury problem. For example, organizations that are rapidly growing or rapidly shrinking often experience higher incidence of soft tissue injury and losses. The causes can range from lack of job training during periods of rapid growth to high stress and anxiety during periods of economic down turn and layoffs. And many professions have experience increases in soft tissue injuries during periods of difficult labor contract negotiation.

What are the causes of the problem?

The first step to understanding the causes of "soft tissue injuries" is to define what conditions are included under this label. For the purposes of this article "soft tissue injuries" is defined as injury or dysfunction in muscles, tendons, joints and nerves that results in functional impairment to strength, range of motion, or proprioceptive sensory function. From an organizational perspective this means the employee who has a soft tissue injury has a reduced ability to physically perform work and activities of daily living. The symptoms of pain, numbness or swelling are often associated with soft tissue injuries.

Some soft tissue injuries are well understood medically; for example muscle strains and joint sprains have very clear symptoms, treatment and rehabilitation procedures. On the other hand, some soft tissue injuries are not well understood at all. Frozen shoulder syndrome and myofascial pain syndrome are two examples of soft tissue injuries where the pathology, treatment and rehabilitation are unclear and vary significantly from clinic to clinic.

From the perspective of occupational safety and health, the more common work-related soft tissue injuries include:

1. Muscle tears, strains and spasm
2. Tendon tears, tendonitis (e.g. tennis elbow), tenosynovitis (e.g. trigger finger)
3. Joint sprains, ligament tears (e.g. ACL tear) , cartilage tears (e.g. damage to knee meniscus)
4. Nerve entrapments (e.g. Carpal Tunnel Syndrome and sciatica)

Ergonomic risk factors

The science of ergonomics considers the following factors of soft tissue injury causation:

1. **Force**; e.g. weight (the force of gravity), speed (the momentum of a body motion), or extreme static muscle contraction (giving a maximum strength effort). Numerous studies have identified the range of safe lifting forces for various kinds of lifting tasks (Mital et al)

2. **Posture.** Posture has several effects.
As a person reaches horizontally away from the body the moment arm of any lifting motion is increased which in turn increases the force acting on the musculoskeletal tissues.
As the angle of any joint reaches its maximum deviation, muscle efficiency decreases and strain on the connective tissues of the joint increases. This can result in increased muscles exertion and decreased blood circulation during task execution. This in turn can result in muscle tissue inflammation or spasm. And, this in turn can lead to muscle pain, tendonitis or nerve entrapment (Chaffin et al)
3. **Fatigue.**
One recognized fatigue factor is repetition of motions to the point of muscle exhaustion and connective tissue inflammation.
Another fatigue factor is static exertion for a prolonged period; e.g. remaining in a sitting position for hour after hour. (Chaffin et al)

Unsafe behavior

These same three risk factors – force, posture, fatigue – also relate to unsafe behavior. Here are some specific examples. An employee can choose to:

1. Manually lift a 200 lb. object (force is the risk factor) rather than getting a fork truck or lifting device that is available at the job site.
2. Reach across a pallet to lift a 15 lb. package in their far Red Zone rather than walking around to the other side of the pallet to lift in their Green or Yellow Zone (posture is the risk factor).
3. Work at a very fast pace and not take a scheduled break in order to complete a task before the end of the shift (risk factor is fatigue).

Pre-existing fitness or medical conditions

Physical Therapy studies have shown that personal risk factors for soft tissue injuries include:

1. Limited range of motion
2. Insufficient or unbalanced strength
3. Insufficient endurance
4. Obesity

The pre-existing conditions listed above can be either work-related (caused by work activities or injuries on the job) or by personal factors including medical conditions or personal fitness choices.

What technologies or strategies are available to prevent injuries or reduce losses?

Based on the experience of the authors, this article will offers six technologies that can contribute to reducing the incidence and severity of soft tissue injuries:

1. Ergonomics
2. Body Mechanics (kinesiology)
3. Wellness and fitness promotion
4. Surveillance and feedback
5. Medical management
6. Allocation of cost and savings

Ergonomics

Ergonomics is a constantly developing discipline that includes academic research, professional practitioners, and a host of products and technology. Ergonomics offers practical technology and guidelines for developing work infrastructure that promotes healthy posture, moderate task forces, and minimized fatigue. One bit of warning – ergonomics can not make it comfortable or safe to stand or sit in one position for a prolonged period of time. The body is designed to move and starts developing pain and dysfunction in the absence of shifting posture and periods of moderate exercise.

There are several recognizable sub-specialties and branches within the discipline – these include:

1. Office ergonomics is a well defined discipline with a wide array of products to reduce the risk of sitting and computer use.
2. Material handling ergonomics is an industry and practical discipline that is rapidly developing. Every year sees new equipment options becoming available and existing equipment becoming more affordable.
3. Manufacturing ergonomics has historically addressed work station design, tool design, task organization and automation. Much of the technology and strategy is aimed at minimizing extremes of force, posture and fatigue.
4. Human factors engineering is a discipline focused on the human-machine interface. The primary objective is to make the information interface and control interface user friendly; and to reduce human error.

Body mechanics (kinesiology)

Body mechanics (kinesiology in the academic world) addresses how to maximize human physical performance and minimize physical stress and strain. Safety In Motion® techniques such as Position Elbows Closer and Same Side Hand and Foot are examples of easy to use body mechanics techniques for material handling. Practical body mechanics training reduces the risk of soft tissue injuries by clearly defining safe and at-risk behaviors. Safe behaviors minimize force, extreme posture and fatigue by:

1. Maximizing musculoskeletal leverage. This is the basis for teaching employees to work with their elbows closer to their side (lateral bottom rib).

2. Using mid-range joint motions to optimize task related posture. The most important mid-range motions are wrist, neck, lumbar, and knee alignment.
3. Optimizing foot position to provide both strength and balance.

Wellness and fitness promotion

Wellness and fitness are the preventive maintenance of soft tissue injury prevention. Fitness and wellness strategies and promotions are increasingly valuable as a counter balance to the aging work force and young workers with sedentary life styles.

A good example of a combination wellness / fitness strategy is the 10 Thousand Steps program. This program distributes inexpensive pedometers, practical strategies for achieving 10 Thousand Steps per day, and promotional rewards for participation.

Nutritional programs like Weight Watchers can help individual employees reduce or prevent obesity. In addition good nutrition is known to improve mental attention, physical endurance and immune system health. All of these factors are thought to have a positive affect on musculoskeletal health and fitness.

Surveillance and feedback

Surveillance and feedback are the guidance systems of an effective safety and health team. There are many systems and tools for surveillance and feedback that focus on soft tissue injury risk factors and performance indicators. These include standard trailing indicators such as recordable injuries, lost work day, and Workers Compensation claims and dollars.

There are also leading indicators that can guide soft tissue injury prevention. A good example is the data and coaching provided by behavior based safety observation systems. The authors have seen many organizations update their critical behavior inventory to include body mechanics and ergonomic behaviors; e.g. Smart setup to work in the Green and Yellow Zone. The resulting data and feedback has proven effective in reducing the risk and incidence of soft tissue injuries in these organizations.

Another source of leading indicators and feedback are safety audit tools that include accepted thresholds for high risk force, posture and fatigue. Examples of audit tools will be presented in this PDC presentation. These audit tools do not have to be comprehensive to be useful. The authors have seen the incorporation of two or three risk factors into a standard safety audit tool result in reduction of soft tissue injuries in the following year.

Medical management

Good medical management of soft tissue injuries results in better diagnosis and treatment as well as informed and skilled return to work practices. Poor medical management (or no medical management) can contribute to higher costs for medical treatment, more expensive Workers Compensation claims, and higher incidence of re-injury following return to work.

The authors have recently observed organizations reduce losses and prevent re-injury through quantification of physical job requirements. This means defining the forces, posture and frequency

involved in the primary tool use and material handling tasks of specific jobs. This information can help physicians and rehabilitation specialists improve the efficiency and effectiveness of their return to work recommendations and prescriptions. And, this same information can be used to improve hiring practices in ways that reduce the incidence and severity of soft tissue injuries.

Allocation of costs and savings

Money talks... and motivates practical injury prevention. Accounting technology can be used to reward managers who successfully prevent injuries. This approach allocates the expected medical and Workers Compensation costs into the operating budgets given to departments or locations. If incidents and claims are below the expected value then the manager sees a corresponding increase in that year's available operating funds. This system of visible costs and immediate reward is highly motivating compared to centralized cost allocation systems that make the costs of treatment, compensation and lost productivity all but invisible to operational managers.

What is the current state of the problem in my organization?

When assessing the current state of the problem (soft tissue injuries) in an organization, there are three questions that can contribute to better analysis and planning:

1. The priority of soft tissue injuries based on incidence and losses?
2. What jobs, operating areas or departments are soft tissue injuries hot spots?
3. What prevention and loss control technologies and strategies are well utilized or under utilized?

For example, in the aerospace industry, specifically space launch and work associated with preparing launch vehicles and spacecraft for their missions poses many unique challenges to reducing exposures to soft tissue injury. By the nature of their design, space launch vehicles, spacecraft and the associated launch systems equipment do not offer friendly workspaces. The use of ergonomic, human friendly design is very limited as the need for compacting a large number of components into small space is critical. This combination produces an environment where soft tissue injury is very common.

Incidence rates still seem to be the key driver for targeting the work that is driving the loss. Very little proactive work is done in the launch systems design stage to consider the human work necessary to "put the thing together". Active systems for observing work typically are lacking, or if they do exist are targeted primarily toward safety issues that can be readily observed such as the proper use of safety equipment, tools, and equipment. Watching work being done with an eye toward identifying exposure to soft tissue injury is lacking.

The hotspot areas of concern for producing the greatest exposure to this type of injury are typically in the area of component integration where access is limited; stretching, reaching, bending and contorting are often the norm in the work. Line of site to the work site becomes an issue; awkward postures have to be used in much of the work, thus setting up the situations where employees are continually exposed to the mechanisms of soft tissue injury, daily.

Much of the focus for preventing injury is directed toward the individual with the newest hot phrase, "situational awareness". This really is just a more sophisticated way of telling people to be

Careful and laying the blame them for their injury. It takes the focus away from the real work needed to improve the design of the work, the design of the tools, the equipment, the need for the right training, and the need for setting the employee up for success with the right expectations associated with the work.

How can I make the most valuable impact on soft tissue injuries in the next two years?

Two years seems to be the middle ground between short term and long term planning. Here are three strategic choices that can help leaders focus on results oriented initiatives:

1. Concentrate on the hot spot.
2. Concentrate on reducing a specific kind of soft tissue injury.
3. Concentrate on or add a specific technology or strategy?

Returning to the aerospace example, one of the authors recommends “Observe, observe, observe”. In other words, the author recommends initially concentrating on the technologies of surveillance and ergonomic analysis. “Injuries are going to tell you a part of the story, but the most valuable impact you can make is reducing the overall exposure to the mechanisms of soft tissue injury. You can’t do this by waiting until they happen then trying to medically manage the cost impact to your organization. You have to get out and look around. You have to create systems that will allow you to identify where the work is exposing your employees to the injury. By concentrating on just the injury you may not see the type of work that is really creating the injury, as it may be spread across several work environments that seem to have no real connection. But, by looking around, watching work being performed, you will connect the types of tasks that are similar and are creating similar types of exposure and resultant injury. If you only use data from your injury investigations you will be spending all of your time trying to figure out what happened as opposed to more effectively spending your time seeing what is happening. Armed with current observation data you will be able to more effectively target a hot spot, a specific kind or injury focus, and the most practical technology for intervention”.