Functional Approach to Reducing Injury Risk

The Goals of this Program:

• A better understanding of the ways employees unknowingly set themselves up for injury.
• Identify ways to perform essential tasks with less injury risk.
• Identify exercises to reduce injury risk.

Pretest

• Problem?

National Statistics Identify An Undeniable Problem

• 1.8 million workers are affected by musculoskeletal disorders (MSDs)
• 80% of workplace injuries are due to worker habits (DOL)
• 600,000 Americans miss work due to MSDs annually
How about MN?

- In MN 3.2 million people employed
- In MN 76,700 work injuries in 2010
- Men accounted for 59% of work-related injuries
  (MN DOLI, 2012)

How Are MN Being Injured?

- The estimated number of cases with work
  injuries has decreased substantially in recent
  years, from 7,750 cases in 2003 to 5,876 cases
  in 2010, a 27 percent decrease.

![Graph showing work injuries]

MSD cases accounted for 18 percent of the
DAFIF cases in 2010, the highest
percentage since 2003.

FACT:
Work-Related Injuries are expensive...

... Direct costs included medical expenses for
hospitals, physicians, and drugs were
estimated to be $51.8 billion

The National Academy of Sciences

Work-Related Injuries are expensive...

... they account for a leading reason for early retirement.
Reducing MSDs with a Functional Approach - Ergonomics

- The relationship between a human, work and the working environment
- Physiological and engineering principles to make motion, function and work both safe and efficient
- Arranging and adjusting the work environment to fit the needs of the individual employee, integrated with the needs of the job.

MSD Defined...

- Injuries and disorders of the muscles, nerves, tendons, ligaments, joints, cartilage and spinal discs.
- Disorders caused by exposure to activities and conditions that involve known risk factors in an industry.

Historical Perspective of Occupational Injury

1. Bernardo Ramazzini – 1717 – First to introduce literature regarding common MSDs in eighteenth century occupations
   a) Ascribes particular diseases to, "...certain violent and irregular motions and unnatural postures of the body..."
   b) Regarding Sedentary workers, "Men and women who sit while they work...become bent, hump-backed and hold their heads like people looking for something on the ground...
   c) Regarding clerks, "The maladies that afflict the clerks...first, constant sitting, second the incessant movement of the hand and always in the same direction, thirdly the strain on the mind from the effort not to disfigure the books by errors..."
   De Morbis Atificum Datiaria, 1717

However, Today we better understand the Physiology of Work-Related Injuries

The effect of these factors is to:

1. Reduce Blood flow and nutrition to working tissues, creating an hypoxia which eliminates the progression of wound repair seen in acute injuries (Josza, et al, 1990)
2. Results in neural inhibition (Jensen et al., 2000)
3. Results in overfiring of muscle tissues due to lack of proprioception (Mense et al., 2001; Yaksh, 1996)
4. Results in more stress at the site of injury (Headley and Hocking, unpublished; Headley, 1997)

We see this every day, or do we?
Neuromuscular Dysfunction

- Neuromuscular Consequences of Injury and Core Dysfunction

Robert R. Harnell MA, ATCa, James R. Beazell PT, DPT, OCS, FAAMPT, ATCb, and Joseph M. Hart PhD, ATCc

- Recurring episodes of present a dilemma for patients and clinicians. Patients who experience disability caused by repeated episodes are limited in their activities of daily living and may suffer from neuromuscular consequences. Core dysfunction can exacerbate these conditions, leading to neuromuscular consequences of injury and core dysfunction.

- Clinicians must be aware of the potential for neuromuscular consequences and core dysfunction to present in patients who experience recurring episodes of injury. Early intervention and targeted treatment can help patients regain function and reduce the risk of further injury.

Occupational Risk Factors that Lead to Preventable Injuries

- Repetition, Repetition, Repetition
- Force
- Awkward and Sustained Postures
- Mechanical or Contact Pressure
- Vibration
- Cold Temperatures

More Risk Factors that Lead to Preventable Injuries

- Poor Body Mechanics: While Lifting, Reaching, Twisting, Bending
- Fitness and Activity Level
- General Physical Health
- Stress
- Non-Occupational Activities

Posture Affects Your Whole Body

- Neck
- Shoulders
- Wrists
- Hands

Nachemson’s (supported by Sato, 1999)
Structural Support

• Bony Structure
• Muscle Structure

Spine – Effect of Postures

The Response of the Nucleus Pulposus of the Lumbar Intervertebral Discs to Functionally Loaded Positions

Spine – Centralization Phenomenon

• Find Directional Preference

How to Focus Treatment

Does it Matter Which Exercise?

Self-Rated Improvement

4/15/2014
Test photo

- What are the differences in these two workers?

Disk Response to Movement - Flexion

Situations That Increase Risk!

- Forward bending - “C” curve
- Forward bend and rotation
- Sustained postures
- Repetitive movement
Abdominal Strengthening

Low Back Strengthening

Pretest
• Problem?

Shoulder Injuries
Glenohumeral Joint
  – Instability
  – Impingement
  – Rotator cuff tears

Acromioclavicular Joint
  – Arthritis
  – Instability
How to Focus Treatment

Shoulder Injury
Referral Patterns

Shoulder Mechanics

- Keep mechanical advantage
- Thumb up
- Fatigue Resistance

How to Focus Treatment

Neck Injury
Referral Patterns

Shoulder Strengthening –
One Arm Row
Pull Down
Elbow Tendonitis

• Active Inflammation
• Pain on outside (Tennis Elbow) or inside of elbow (Golfer’s Elbow)

Over Use?

How to Focus Treatment

Treating Tendon issues
- Elbow, Achilles and beyond

Anatomic Difference - Tendinosis

• Normal tendon
  - White
  - Glistening
  - Firm
  - Uniform bundled collagen fibers

• Abnormal tendon
  - Dull
  - Soft
  - Brown/grayish in color
  - Loss of collagen continuity

A New Paradigm for a Difficult Clinical Problem
Karim M. Khan, MD, et al
THE PHYSICIAN AND SPORTSMEDICINE
VOL 28 NO. 5 - MAY 2000
• Knee and ankle

Knee and Ankle
• Mechanics at the foot and ankle can set up knee injuries
• Straight line between ankle, knee and hip

Leg Strengthening and Improved Balance

Office Design
• Self Test
  – Thigh parallel to the floor
  – Chair back is supportive
  – Wrist is at level of elbow or slightly higher
  – Keyboard legs out of use
  – Keep items commonly used with in easy reach
So, where do we start?

Begin with…

- Proper Equipment
- Watch for hazards
- Know your environment

Changing Habits Begins at Home

Training to reduce risk.

- Strength vs. endurance
- Proprioception
- Stabilization
- Recovery
Our Mission is to reduce injury risk and optimize your health!

Thank you
Reactive
Respond Modify
Check on Employees Well Being

Valid
Ask Questions
Plan Future—parties heard

Evaluation
How did RTW go?
All Parties?
F/u scheduled

Legible/Logistics
No Abbreviations, Signature
MD, PA, CNP
Who has the work slip
Don’t forget we have PPO App!