16th Annual Applied Ergonomics Conference
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The Hilton Anatole Hotel, Dallas Texas
What’s driving YOUR back pain?

Reducing Low Back Pain in High Mileage Drivers

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Inventor of BackBone Cushion, Patented
Physical Therapist, business owner & inventor

Danielle Vernon, CEO WorkWise Ergonomics, LLC

- >12 yrs orthopedic spine & sport experience
- >10 years in physical therapy clinical leadership
- Work-site Injury prevention programs
- Published author on posture and back issues
- Avid athlete and user of The BackBone Cushion
Slumped. Hunched. Slouched…..Pain &**@*

4 out of 5 Americans will suffer from back pain

- 2nd reason people see a doctor
- Leading cause of missed workdays
- 42 is the average age for back surgery
- Leading cause of disability under age 45
- 70% of sufferers experience recurrence.
Understanding your Back

Anatomy
Risk Factors
Myths
Supported Research
The Role of Ergonomics
Anatomy

Bony lumbar spine

Discs between the vertebrae

Ligaments around the spine and discs

Spinal cord and nerves

Muscles
Common RSI’s and MSD’s

- Low Back Pain
- Shoulder Tendonitis
- Carpal Tunnel Syndrome
  - Sciatica
- Upper back and neck syndromes
  - Headaches
  - Knee Pain
  - Hip Pain
Drivers, in particular...

Primary areas of complaint

- BACK
- NECK
- SHOULDER

• More frequent absences from work
• longer duration
• report tension, mental overload
• retire earlier and at a younger age
• usually accompanied by disability.
Why are we seeing more MSDs?

- Poor physical fitness levels
- Older workforce
- Increased work load
- More physical and mental fatigue
- Better educated about their bodies
- Static work and home postures
- One size fits all – job, home and recreational activities

AND..........
Postural neglect

- most common cause of low back pain.
- brought on by sitting for a long time in a poor position

- Easily eliminated merely by correcting one’s posture

- Uncorrected, habitual poor posture causes
  changes to the structure and shape of the joints;
  excessive wear occurs,
  loss of elasticity resulting in premature aging of the joints.
  decreased lung expansion and circulation to hands and feet

The effects of poor posture in the long term, therefore, can be just as severe
and harmful as the effects of injury
Bad Posture

Forward head
Rounded shoulders
Decreased lung expansion
Increased pressure on diaphragm
Decreased air exchange
Decreased oxygen to muscles
Increased fatigue
Inefficient muscle contraction
Higher risk for muscle strain
Decreased healing potential
General Risk Factors
(Based on OSHA Ergonomic Standards)

Posture/Position
Repetition
Force
Contact stress
Vibration

“The frequency and duration of a task, make a risk factor more likely to occur.”
Professor Mark Porter, UK: 6 x higher absence from work d/t back pain when drivers are at the wheel for > 4 hrs/day

“Long periods at the wheel can seriously damage your health, particularly if seats do not allow optimum posture and drivers do not 'fit' their seats," he says.

March 2011, Spine: workstation design and work posture, sedentary work position, repetitive work and precision work elevated the risk of back and neck pain.

AMJ 2010: Work-related MSD, especially low back pain, cause substantial economic losses to individuals as well as to the community.
• 81% of American bus drivers have experienced LBP during their present job
• Most commonly identified physical factors are prolonged sitting, whole-body vibration, ergonomic mismatch among drivers, the type of vehicle seat, and driving mechanisms
Risk Factors for Back Pain

- Oversized seat
- Broken down seat, asymmetrical
- Longer leg than arm length
- Non-adjustable steering wheel
- Repetition in one direction
- Fatigue
- Poor nutrition
- Poor arm support
The Alternatives
The KEY....

PREVENTION

NOT

REACTION
What is an ergonomic injury?

- Pain and dysfunction as a result of static and/or awkward postures especially when there is force, repetition or contract stress involved
- The tissues most often involved are the nerves, tendons and or fascia
- “an Ergonomic injury is primarily a nutrient pathway disorder”
Highest Risk Factors noted in OSHA Ergonomics Program
(Repealed 2001)


- Repetition – 2 to 4 hours
- Force – Specific weights or 2 hours exposure
- Awkward Postures – 2 hours of exposure
- Contact stress – 2 hours
- Vibration – 30 minutes or 2 hours of exposure
How to assess Injury Costs

- Ergonomics is cost effective.
- Ergonomics is not just “feels good PR”, it really pays off.
- For example, if a self-insured company is operating at a 4% profit margin and incurs one carpal tunnel syndrome release surgery at a total cost of $10,000 (surgical costs, time off from work, training of replacements, etc), the sales force would have to generate an additional $250,000 in sales to offset the cost of the injury ($250,000 x 0.04 = $10,000).

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Sales necessary to offset the cost of accidents and injuries at different profit margins
Estimating the impact of accidents

Let's try something more reasonable such as a minor back sprain that someone may go to one doctor’s appointment, 8 physical therapy visits and 8 cumulative hours away from work.....

$2,000 \text{(Direct cost)} \times 4.5 \text{(Cost Multiplier)} = $9,000 \text{(Indirect Cost)}

\text{Total Cost} = \text{Direct Cost (9,000)} + \text{Indirect Cost (2,000)} = \text{Total $11,000}

What if you had 25 claims like this one. $11,000 \times 25 = $275,000

Calculate your Impact on Profitability

\[
\frac{10,000}{100,000} \text{Total Profits} = \text{Profit Margin (.1 or 10%)}
\]

- Total Cost of \text{Injury/Illness} $275,000 = $2,750,000 \text{(Sales required to pay for injury or illness)}
- Profit Margin 10% (0.1)
How Can We Decrease worker injury and improve job satisfaction?

- **Assess** – the problem
- **Identify** – the key factors
- **Educate** - individual and mgmt
- **Recommend** - plan of action
- **Plan** - to implement changes
THANK YOU!

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