Scope of the Problem

Fact: 1.8 million workers report WRMSD each year

Fact: WRMSD account for over 60% of all occupational illnesses / 20 billion annually in workers compensation costs
Work Place Injuries
Cumulative Trauma Syndrome

Reasons for persistence of the problem...

• Causation Unknown
• Production/Profit driven society
• Medical Team shortcomings
  Medical study defects
• Injury Industry
  Employers/Insurance/Providers
  Attorneys/Legislators/Beurocrats
Cumulative Trauma Disorder
Medical Decision Making
Cumulative Trauma Disorder

Medical Decision Making

The Patient
The Family
The Insurance company
The Case manager
The Lawyer(s)
The Labor union
The Employer
The Government

The Doctor with The Facts!
Cumulative Trauma Disorder
Carpal Tunnel Syndrome

“Just the facts mam….
We’re only interested in the facts….”

Jack Webb

“Dragnet”

*Image of U.S. News & World Report cover with the headline: Working Harder Than Ever - America thrives on crazy hours, fast food, and high-tech energy.*
The Medical Report

- The Agent / Force Producing an Effect
- Sufficient Grounds
- Good Reason
Cumulative Trauma Disorder

WORMS

• Reasonable in light of known facts

• Force of persuasive reason to a logical mind
Epidemiologic Data

1. Tobacco Co. Indictment
2. Radium Dial Workers
3. German Rocket Workers
4. Vinyl Chloride Workers
5. Miners- Asbestos
Cumulative Trauma Disorder

WORMS

Causation and Epidemiology


652 Active Workers / Incidence CTS

0.6% Low Force – Low Repetition

5.6% High Force – High Repetition

• High Force / High Repetition Ration 15 (P < .001)
  High repetition greater risk then high force
Cumulative Trauma Disorder

WORMS

Causation and Epidemiology

• 1988 Hagberg, M.
  Epidemiology in Occupational Health
  Amsterdam: Elsevierk Sci Pub
  1998:15-26

• 1989 Osorioam et al.
  CTS Among Grocery Store Workers
Cumulative Trauma Disorder

WORMS

Causation and Epidemiology

  CTS as Etiologically Related to Occupational Exposures

  Workplace Ergonomometric Factors and the Development of MSK Disorders / A Meta-analysis
  *Calif Dept Health Services* 1989:61
Cumulative Trauma Disorder

WORMS

Major Occupational Factors in Development of CTS

1. Repetitive Motion
2. Forceful Grasping
3. Extreme Wrist Flexion / Extension
4. Mechanical Stress to Median Nerve
5. Exposure to Vibration

B.A. Silverstein, et al.
Cumulative Trauma Disorder

WORMS

NIOSH / Linda Rosenstock

• . . . after review of hundreds of ergonomic studies “we know from current science that MSDs can develop from or become exacerbated by factors associated with work . . .”
Cumulative Trauma Disorder
Medical Decision Making

Case Illustration
L.R. is a 40yr old woman who performs light assembly work for the Sony Co.

- She moves a 40lb TV chassis off the moving line. Performs 5-6 tasks on the chassis using pneumatic tools and then pushes the chassis back onto the line.
- The distance between the moving line and her tool use area is about 2 ft.
- The activity is repeated every 20 sec.
<table>
<thead>
<tr>
<th>Weight</th>
<th>Distance</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>80lbs</td>
<td>2ft</td>
<td>every 20 seconds</td>
</tr>
<tr>
<td>240lbs</td>
<td>6ft</td>
<td>every 1 minute</td>
</tr>
<tr>
<td>14,400lbs</td>
<td>360ft</td>
<td>every 1 hour</td>
</tr>
<tr>
<td>115,200lbs</td>
<td>2880ft</td>
<td>every 1 day</td>
</tr>
<tr>
<td>576,000 lbs</td>
<td>14,400ft</td>
<td>every 1 week</td>
</tr>
<tr>
<td>28,800,000 lbs</td>
<td>720,000ft</td>
<td>every 1 year</td>
</tr>
</tbody>
</table>
Every year L.R. pushes/pulls
28,800,000lbs    720,000ft

A GMC Suburban weighs 6000lbs
28,800,000lbs = 4,800 Suburbans

L.R. pushed 4,800 Suburbans from San Diego to Los Angeles in 1 year
Cumulative Trauma Disorder
Medical Decision Making

Case Illustration
D.A.- packs 60 tacos in a plastic bag and seals the bag with a “twisty” wire. She packs 3 bags per minute.

D.A. packs:

180 tacos per minute
10,800 tacos per hour
86,400 tacos per day
432,000 tacos per week
21,600,000 tacos per year

Cumulative Trauma Disorder
Carpal Tunnel Syndrome
Cumulative Trauma Disorder
Work Simulation Studies
Cumulative Trauma Disorder
Carpal Tunnel Syndrome

Volumetric Change with Repetitive Use

<table>
<thead>
<tr>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>665 ML</td>
<td>655 ML</td>
</tr>
<tr>
<td>680 ML</td>
<td>690 ML</td>
</tr>
</tbody>
</table>
Cumulative Trauma Disorder
Carpal Tunnel Syndrome

Dynamic Carpal Tunnel Syndrome

Volumetric Increase Associated With Sensory Loss
Cumulative Trauma Disorder
Carpal Tunnel Syndrome

Dynamic Carpal Tunnel Syndrome

Volumetric Increase
Associated With Sensory Loss
Cumulative Trauma Disorder
Carpal Tunnel Syndrome

Carpal Tunnel Syndrome Simulation Study
Cumulative Trauma Disorder
Carpal Tunnel Syndrome

Carpal Tunnel Syndrome Simulation Study

Sensory Loss
MSE 2.44

Normal Body Posture
Cumulative Trauma Disorder

Carpal Tunnel Syndrome

Simulation Study

Sensory Loss
MSE 3.84 – 5.0

Abnormal Body Posture
Cumulative Trauma Disorder

WORMS

- Cervical strain syndrome
- Cervicobrachial pain syndrome
- Cervical degenerative disc disease
- Cervical cephalalgia
- Shoulder bursitis / tendonitis
- Shoulder impingement syndrome
- Bicipital tendonitis
- Epicondylitis medial / lateral
- Tendonitis forearms / wrists
- Tenosynovitis / flexor-extensor / hands
Cumulative Trauma Disorder

Medical Decision Making

Return to Work

Regular
100
Moderate
Light
None

Time →
Cumulative Trauma Disorder

Medical Decision Making

The Functional Recovery Curve and Return to the Workplace
Work Place Injuries
Cumulative Trauma Syndrome

When Can This Patient Return to Work?

Functional Recovery Curves
Work Place Injuries
Cumulative Trauma Syndrome

Measurement of a Significant Variable

What are we measuring?
Why does it matter?

Patient Response
Physician Response
Functional Recovery Measurement
Overall Outcome
Can we bring it all together?
Can we devise a reasonable prevention and treatment strategy?
Research / Education
Cumulative Trauma Disorder
Medical Decision Making

- The Patient
- The Family
- The Insurance Company
- The Case Manager
- The Lawyer(s)
- The Labor Union
- The Employer
- The Government

The Doctor
. . . The Facts will usually allow the doctor to retain control of the treatment process

. . . The Facts establish authority . . .
Cumulative Trauma Disorder

WORMS

• Reasonable in light of known facts

• Force of persuasive reason to a logical mind
Let the Force...
Be With You...