

WORK RELATED
MUSCULOSKELETAL
DISORDERS (WMSDs):

A Reference Book for Prevention

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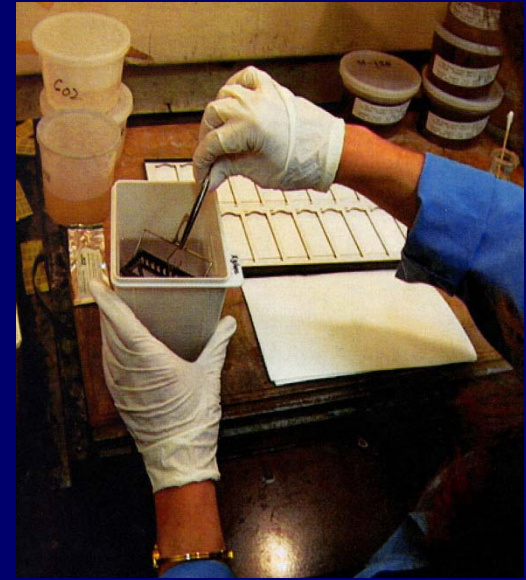
Work Place Injuries

Cumulative Trauma Syndrome

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

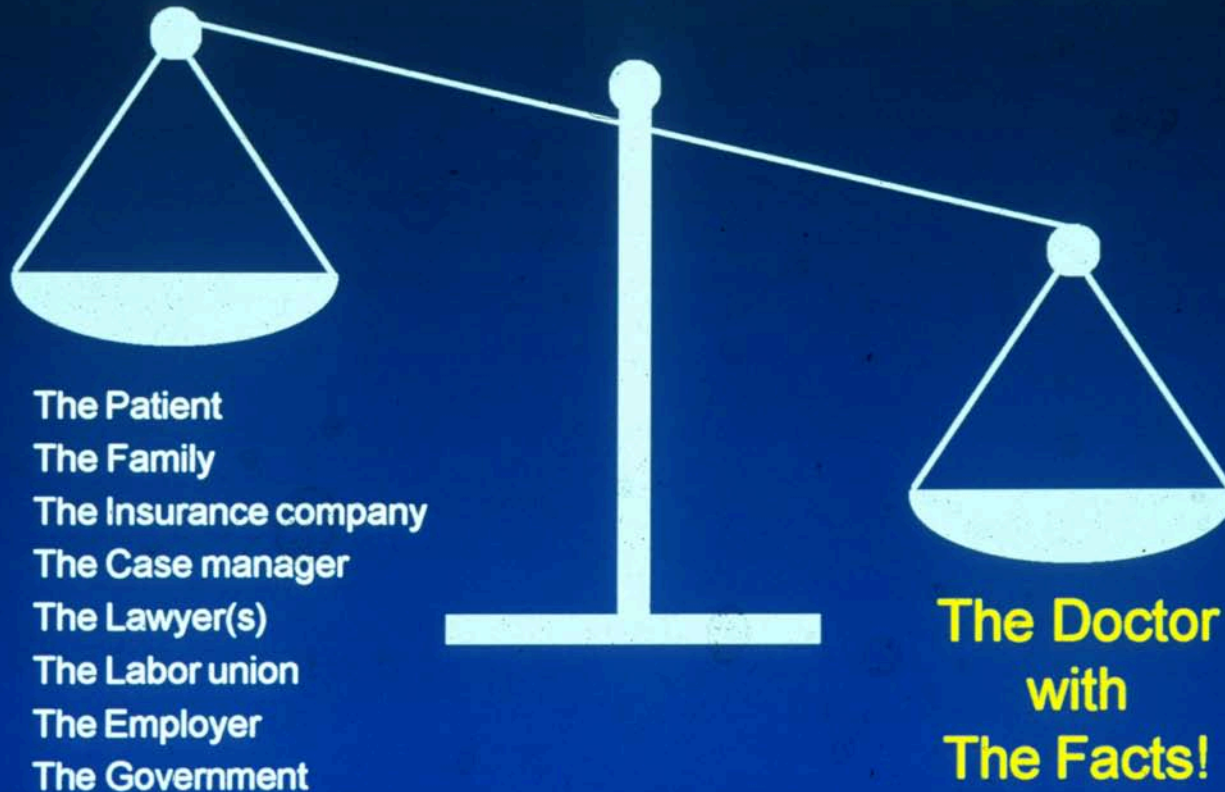
Medical Decision Making

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



Cumulative Trauma Disorder

Medical Decision Making



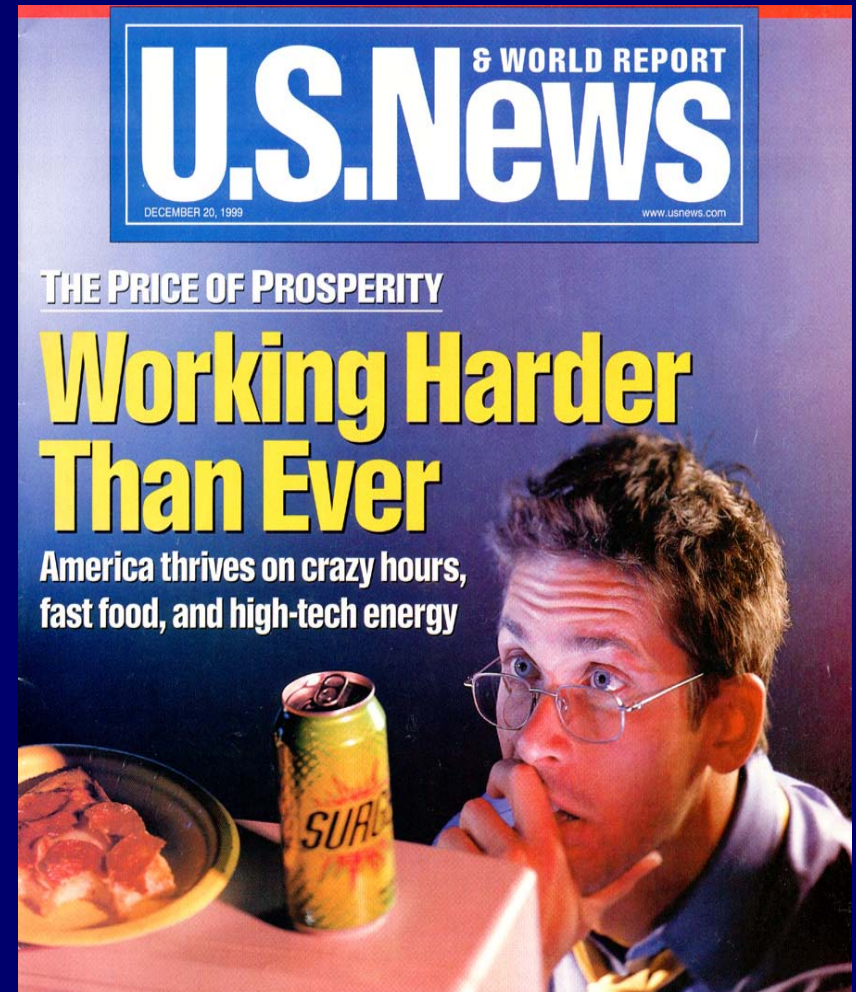
Cumulative Trauma Disorder Carpal Tunnel Syndrome

“Just the facts
mam....

We’re only interested
in the facts....”

Jack Webb

“Dragnet”



Cumulative Trauma Disorder

WORMS

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

Cumulative Trauma Disorder

Carpal Tunnel Syndrome

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

- Silverstein, B.A. et al. *Am J Ind Med*, 1987

652 Active Workers / Incidence CTS

0.6% Low Force – Low Repetition

5.6% High Force – High Repetition

- **High Force / High Repetition Ratio 15 ($P < .001$)**
High repetition greater risk than high force

Cumulative Trauma Disorder

WORMS

Causation and Epidemiology

- 1988 Hagberg, M.
Epidemiology in Occupational Health
Amsterdam: *Elsevier Sci Pub*
1998:15-26
- 1989 Osorioam et al.
CTS Among Grocery Store Workers

Cumulative Trauma Disorder

WORMS

Causation and Epidemiology

- 1991 Gerr, F., et al *Ann Rev Publ Health* 12:543-66, 1991
CTS as Etiologically Related to Occupational Exposures
- 1991 Stock, SR. *Am J Ind Med* 19:97-101, 1991
Workplace Ergonomic 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**

Cumulative Trauma Disorder

Carpal Tunnel Syndrome

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.

Cumulative Trauma Disorder

Carpal Tunnel Syndrome

L.R Push-pulls:

80lbs	2ft every 20 seconds
240lbs	6ft every 1 minute
14,400lbs	360ft every 1 hour
115,200lbs	2880ft every 1 day
576,000 lbs	14,400ft every 1 week
28,800,000lbs	720,000ft every 1 year

Cumulative Trauma Disorder Carpal Tunnel Syndrome

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**

Cumulative Trauma Disorder

Carpal Tunnel Syndrome

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 Work Simulation Studies



Cumulative Trauma Disorder Carpal Tunnel Syndrome

Volumetric Change with Repetitive Use

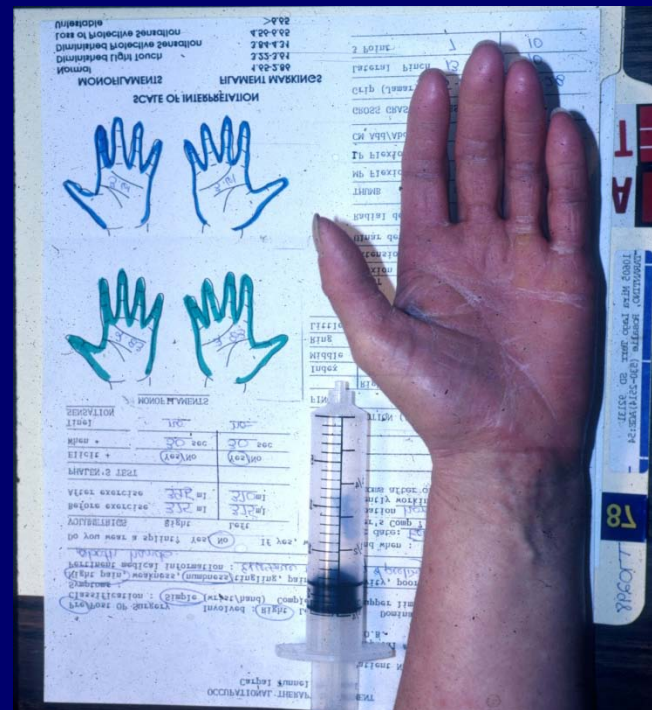
Right	Left
665 ML	655 ML
680 ML	690 ML

10 Minute Work Simulation

Cumulative Trauma Disorder Carpal Tunnel Syndrome

Dynamic Carpal Tunnel Syndrome

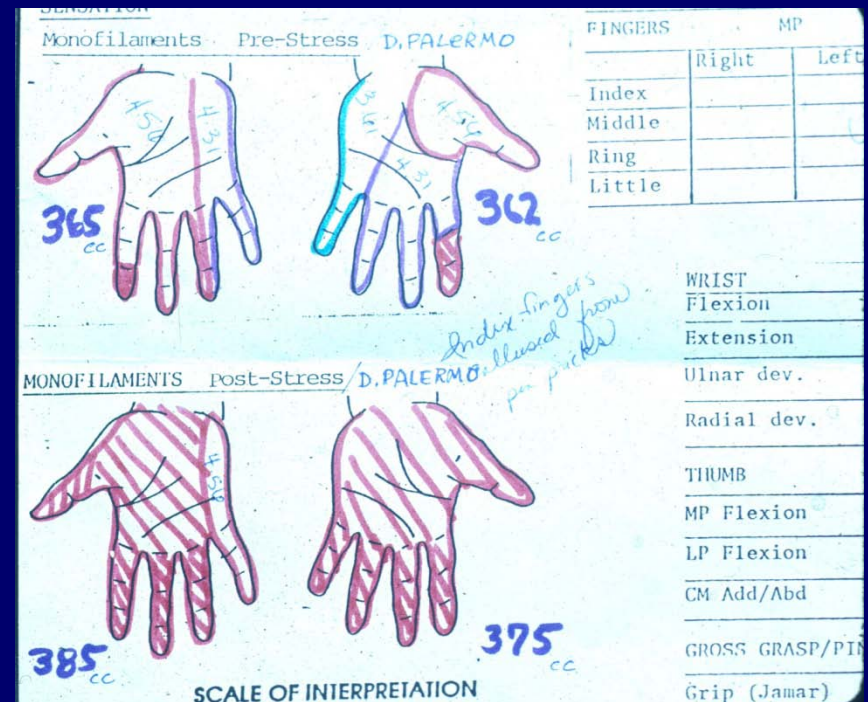
Volumetric
Increase
Associated
With
Sensory Loss



Cumulative Trauma Disorder Carpal Tunnel Syndrome

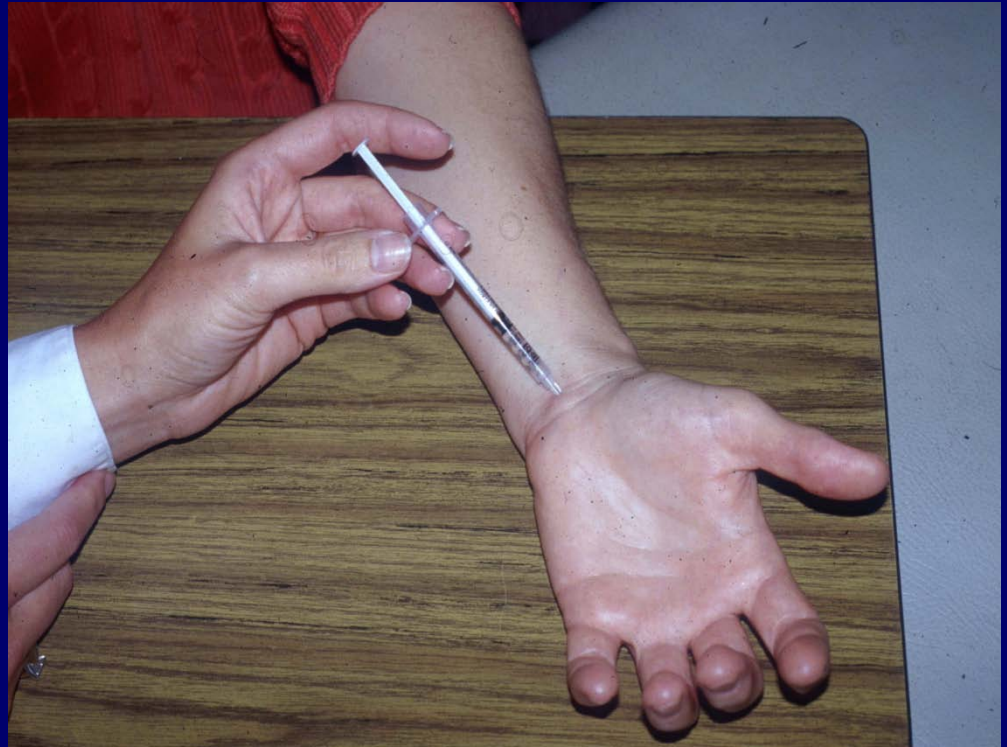
Dynamic Carpal Tunnel Syndrome

Volumetric
Increase
Associated
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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

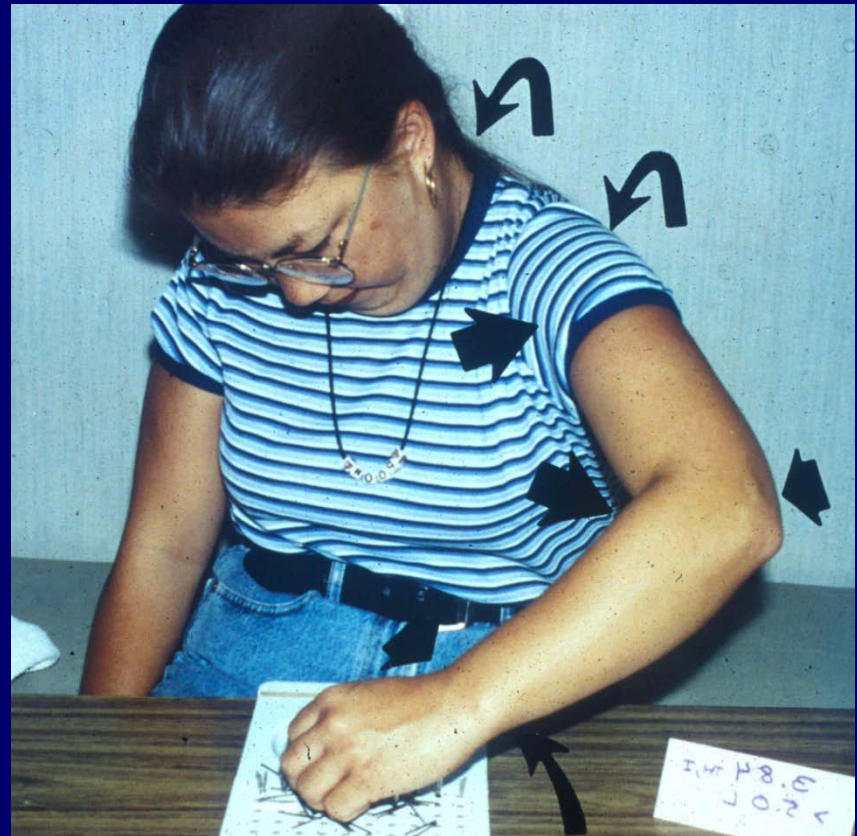


Cumulative Trauma Disorder Carpal Tunnel Syndrome

Carpal Tunnel
Syndrome
Simulation Study

Sensory Loss
MSE 3.84 – 5.0

Abnormal Body
Posture



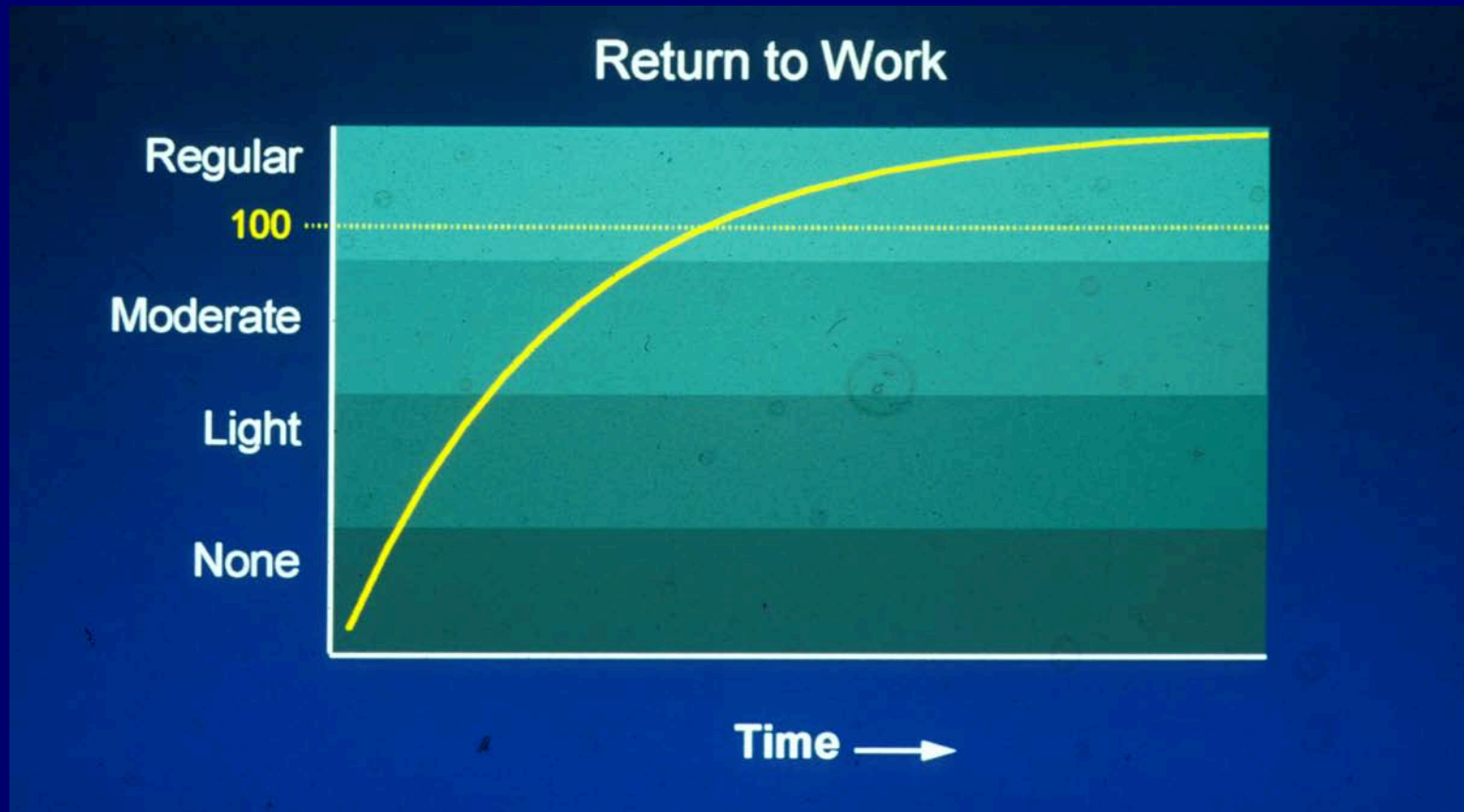
Cumulative Trauma Disorder

WORMS

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

Cumulative Trauma Disorder

Medical Decision Making

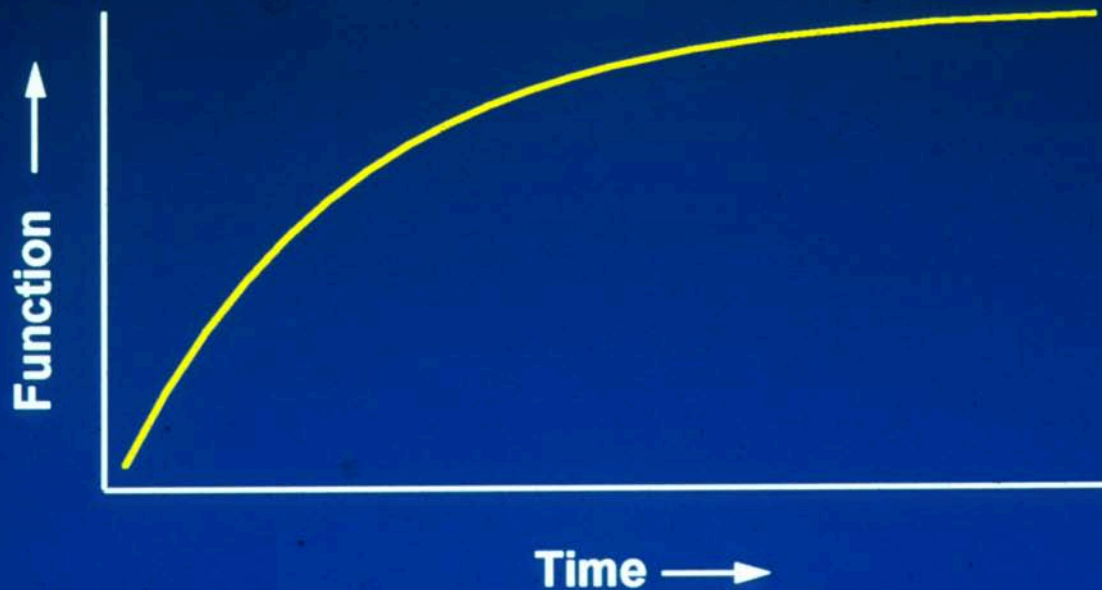




Cumulative Trauma Disorder

Medical Decision Making

The Functional Recovery Curve and
Return to the Workplace





SANDIE
VONS

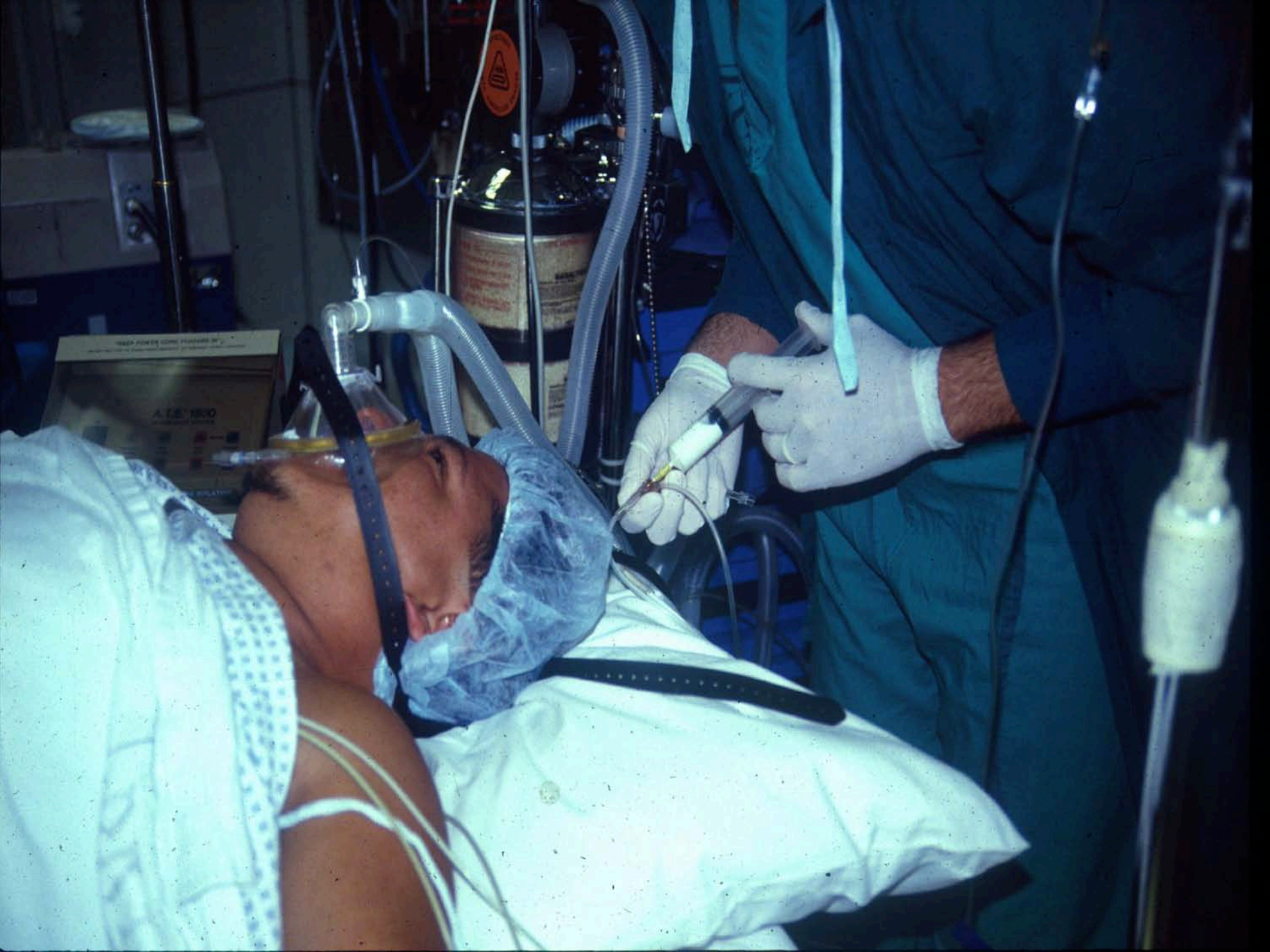
79

99

1

Indirect

Red sign on the right side of the counter.

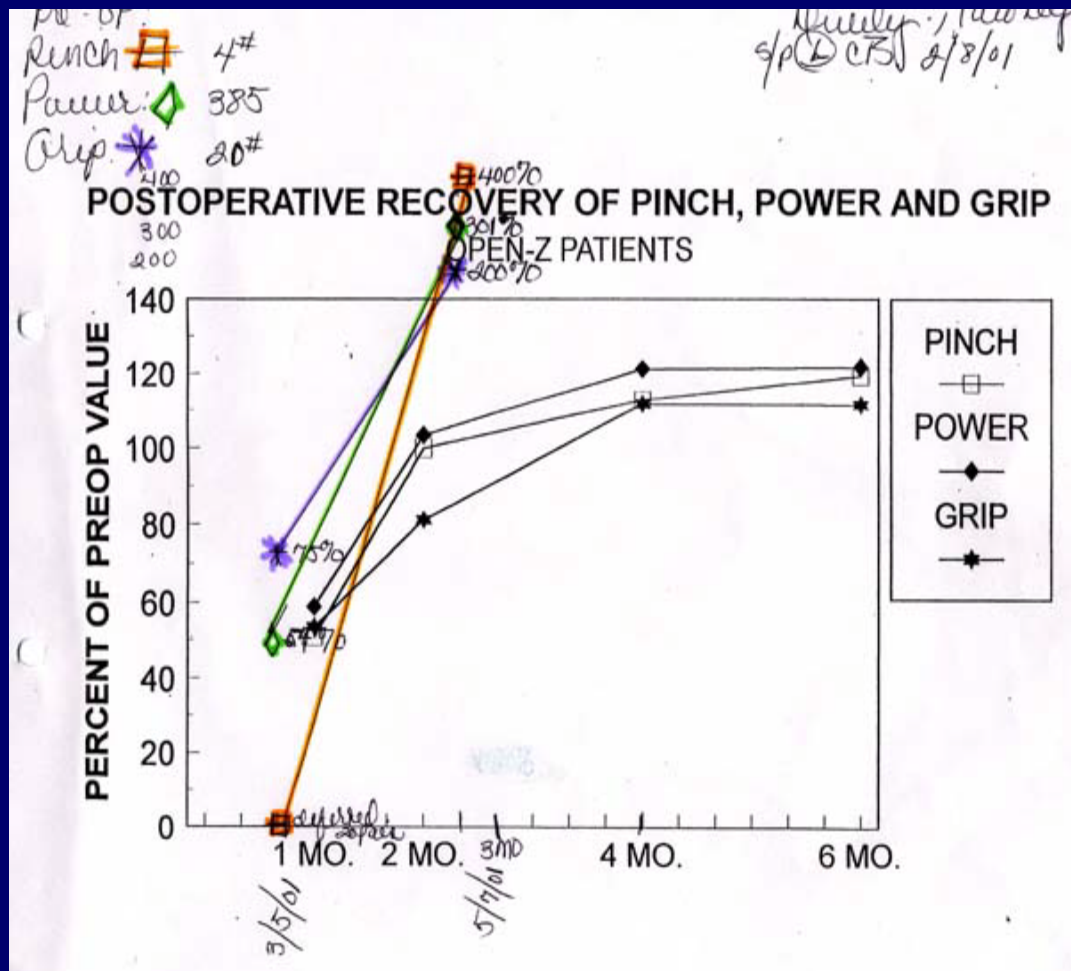


Work Place Injuries

Cumulative Trauma Syndrome

When
Can This
Patient
Return to
Work?

Functional Recovery Curves



Work Place Injuries

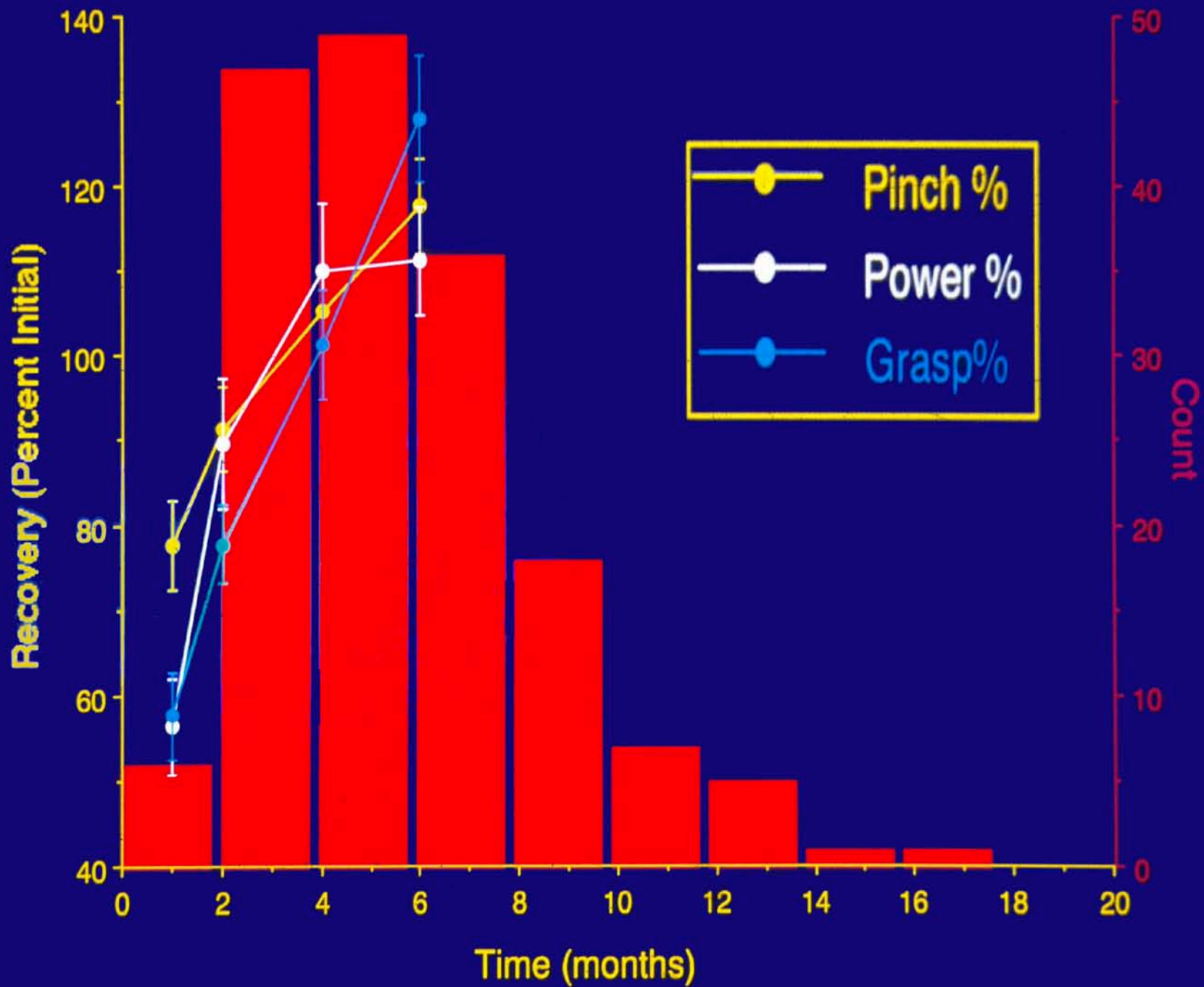
Cumulative Trauma Syndrome

Measurement of a Significant Variable

What are we measuring?
Why does it matter?

Patient Response
Physician Response
Functional Recovery Measurement
Overall Outcome







If you are purchasing an alcoholic beverage and appear to be under 21 years of age, please be prepared to show identification.

WIC PURCHASERS:
Many will only accept WIC vouchers for the exact items on the vouchers.
WIC Authorization Cards must be presented upon purchase.

WIC MASTER CARD
The WIC program is authorized to be used for the purchase of groceries for WIC-eligible households.
WIC is a federal program authorized by the U.S. Department of Agriculture to assist low-income pregnant, postpartum, and breastfeeding women, infants, and children under the age of 5 to meet their nutritional needs.

Cumulative Trauma Disorder

WORMS

- Can we bring it all together?
- Can we devise a reasonable prevention and treatment strategy?
- Research / Education

Cumulative Trauma Disorder

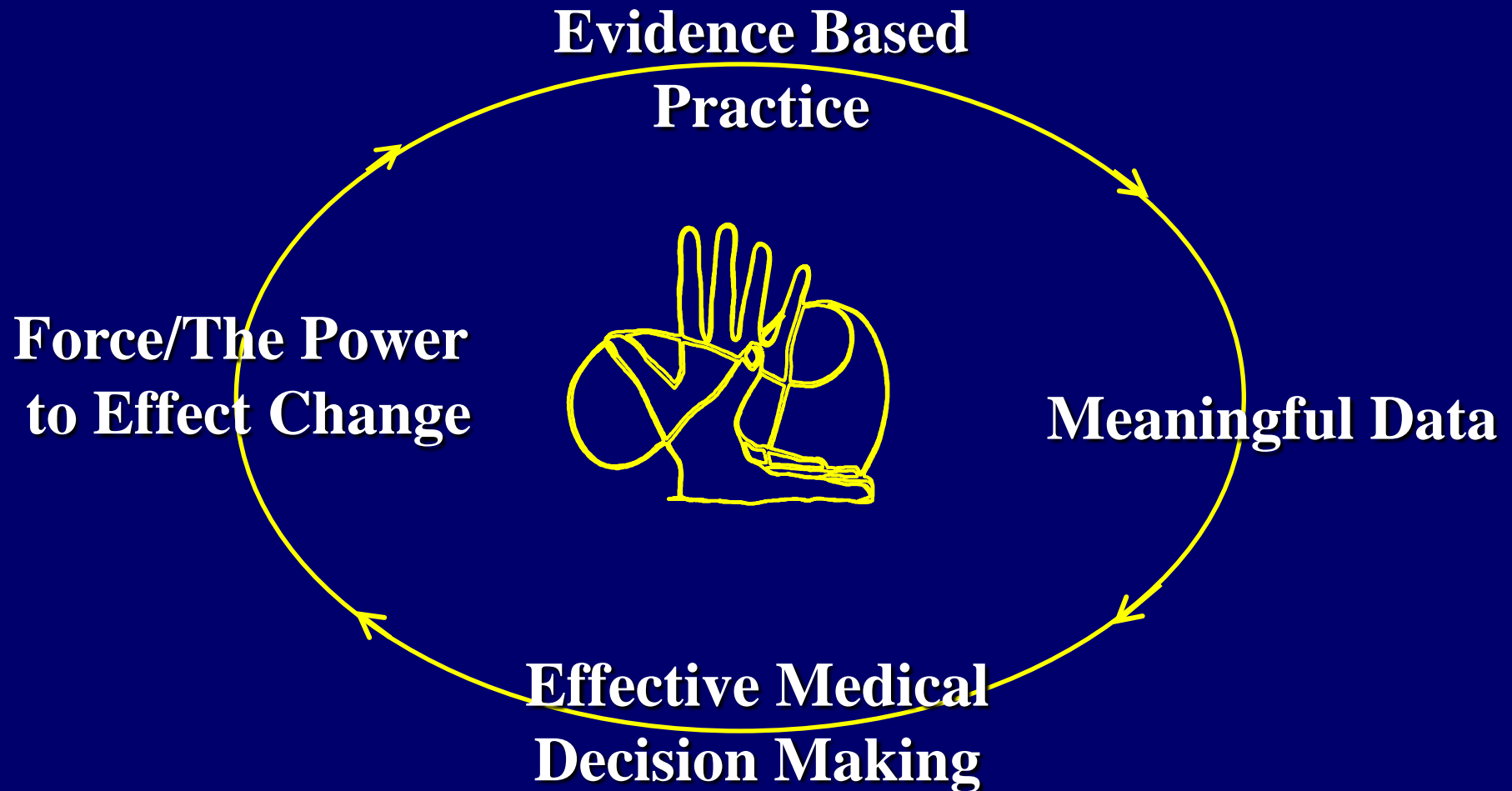
Medical Decision Making

- The Patient
- The Family
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- The Labor Union
- The Employer
- The Government

The Doctor

Work Place Injuries

Cumulative Trauma Syndrome



Cumulative Trauma Disorder

Medical Decision Making

... 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...