

Exploring Environment and Health Connections

Occupational Health and Safety

October 13, 2011

My Job Is Killing Me

9,000 disabling injuries per day
One every second

150+ deaths each day
~ 6,000 in USA in 2008
– 16 injury related deaths
– 137 illness related deaths

~80/year in Washington



How Much Do Work-related Injuries and Illnesses Cost?

\$145 billion for occupational injuries

\$ 26 billion for occupational illnesses

\$ 171 billion total

Just the tip of the iceberg (indirect costs)

Compared to

\$ 33 billion for AIDS

\$ 57 billion for Alzheimer's disease

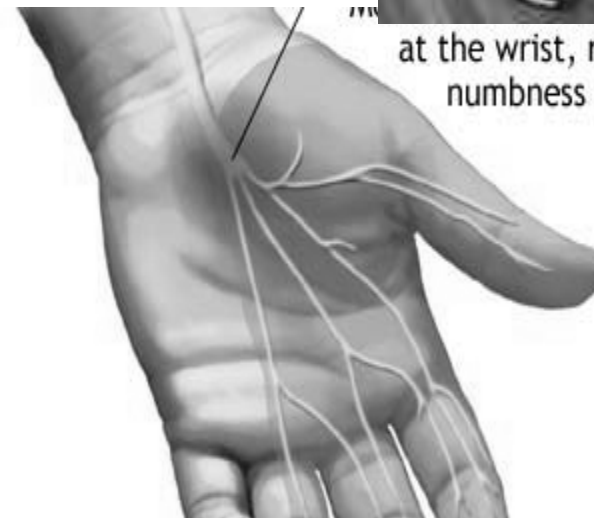
\$ 164 billion for circulatory disorder

What Kind of Problems?

Overuse syndromes	267,600
Skin disorders	57,000
Toxic lung problems	20,300
Physical hazard	16,600
Poisonings	5,100
Dust in the lungs	2,900
<u>All others</u>	<u>50,600</u>
Total	429,800

Musculoskeletal Disorders

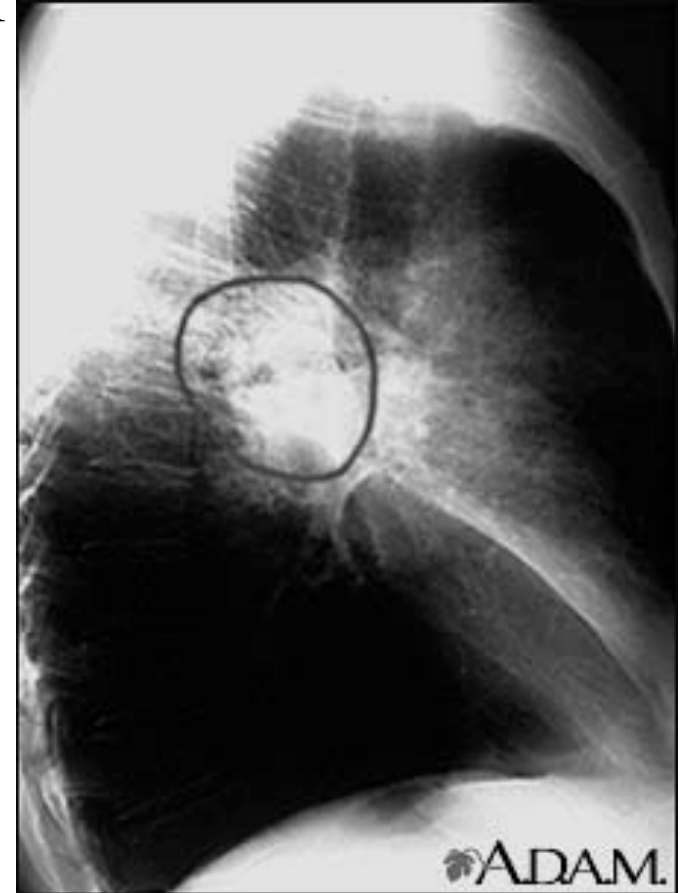
- MS disorders cost \$50 billion/yr.
- Back pain
- Upper extremity overuse syndromes
 - Carpal tunnel



at the wrist, resulting in numbness or pain

Occupational Cancer

- 2-10% of cancers are of occupational origin
- Lung
 - Smoking
 - Asbestos
 - Arsenic
 - Chromium (Hexavalent)
 - Silica
 - Radon
- Skin
 - Sunlight



What do we do about injured workers?

American Occupational Medicine

- **Alice Hamilton** (1869-1970)
 - Physician, Occupational Medicine (1893 U of Michigan)
 - Multiple books on hazards in US industries
 - First female faculty member at Harvard
 - Helped to formulate legislation to correct industrial conditions



What about Employers?

- Employees are assets, but.....
- Early defenses against worker injury claims
 - Fellow servant
 - Contributory negligence
 - Assumption of risk
- Expensive, uncertain outcomes, ethical concerns
- Who is responsible? Who has the power to make changes?

Workers' Compensation

- Passed in Europe in 1880s-1890s
 - Germany (1884); England (1897)
- US federal employees covered in 1908
 - workers involved in interstate trade
- State laws early 1900s, but constitutional questions not resolved until 1917
 - Washington state 1911
- By 1921, 46 states had some kind of workers' compensation law

Workers Compensation

- Different state to state
 - Ex: payment for the loss of a hand (\$20K - \$200K)
- If you work for someone you are covered
- In general
 - A no fault insurance system
 - Provides benefits to workers injured and ill from work
 - Medical care
 - Time loss
 - Compensation for disability
 - Encourages safety programs

Workers Compensation challenges

- Variety of insurance schemes
 - state insurance or private insurance
- Workers (or caregiver) must prove that illness or injury was more likely than not from work
- Illnesses are often hard to link to work
- Workers agree not to sue their employers
- Workers may not be 'made whole'
 - No punitive damages for negligence, pain & suffering
- Prevention – where does it fit in?

After the Triangle fire

- Investigations
- Fire codes
- Safety laws



Occupational Safety and Health Act

An Act to assure safe and healthful working conditions for working men and women, by authorizing enforcement of the standards developed under the Act, by assisting and encouraging the States in their efforts to assure safe and healthful working conditions, by providing for research, information, education, and training in the field of occupational safety and health, and for other purposes.

- Public Law 91-596
- Congressional authority over interstate commerce
- 91st Congress; President Nixon
- December 29, 1970

What is OSHA and where does it fit?

US Federal Agency

- Legislative (Congress/Senate)
 - Writes laws
 - Occupational Safety and Health Act
- Executive (President/White House)
 - Implements legislation
 - Oversees Agencies
 - Occupational Safety and Health Administration (OSHA)
- Judicial (supreme court)
 - Interprets laws



- Mission: to assure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health.
- 200 offices; 2100 inspectors
- 22 state plans; +Connecticut; NJ; NY
- miners, transportation workers, many public employees, and the self-employed not included

Occupational Health and Safety Administration (OSHA)

- David Michaels, PhD,
MPH Assistant Secretary,
DOL
- 3.7 million recordable
cases (2008)



Washington State OSHA

RCW title 49.17; WAC 296.62

Washington Industrial Safety and Health Act (**WISHA**)

Division of Occupational Safety and Health (DOSH)

in Dept of Labor and Industries (also WC; Employment Security)

“State plan state”

At least as effective

Not more than 50% federal support

Accident Prevention Plans (WAC 296-24-040)

Health & Safety committees

Occupational Exposure Standards

- Assume that there is a threshold below which harmful biological effects are not detected
- Reflect the quality of the data used by the standard setting agency
- May not protect all people in all situations
 - Individual health status
 - Work rate
 - Work environment (temperature, humidity, multiple exposures)
- Compliance measurements may be imprecise
- Influenced by technical and political feasibility

How do we protect workers?

Occupational Health & Safety Professionals

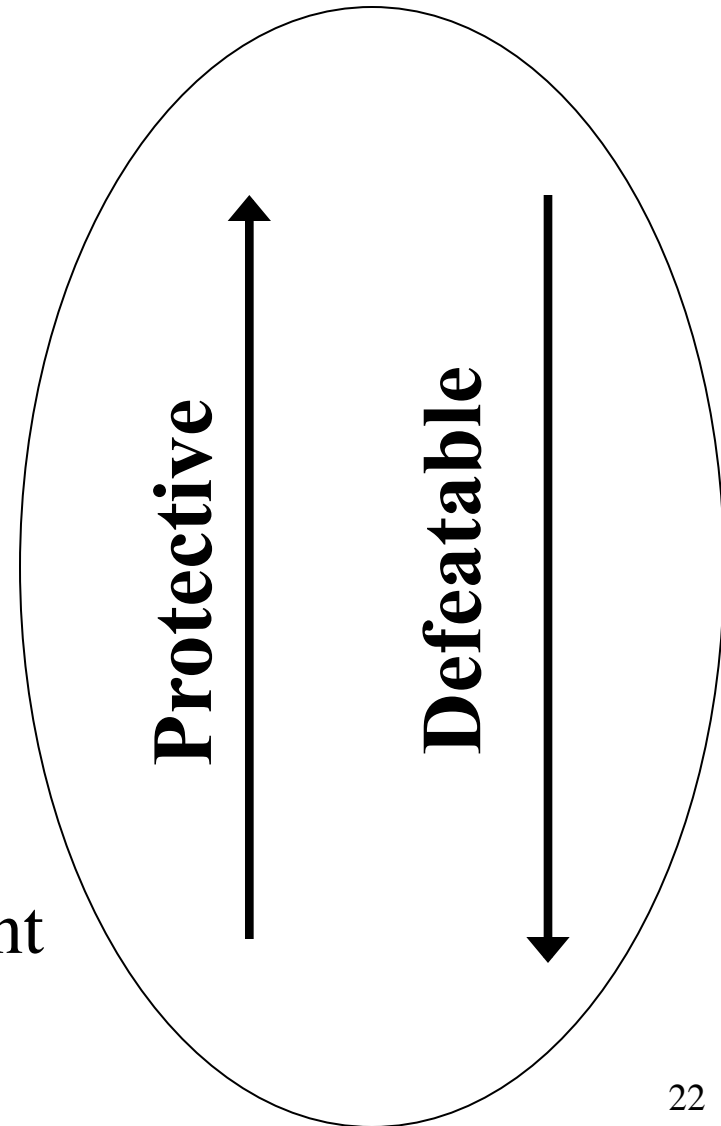
- Occupational Medicine Physicians
- Occupational Health Nurses
- Industrial Hygienists
- Safety professionals
- Ergonomists
- Toxicologists

Assessment & Control Strategies

Source ----- Pathway ----- Recipient

Hierarchy of Controls

- **Substitution/Elimination**
 - Hazard
 - Process
- **Engineering Controls**
 - Enclosure process or worker
 - Isolation process or worker
 - Ventilation
- **Warnings**
 - System Interrupt
 - Signaling; signs
- **Administrative**
 - Management choices
 - Education
- **Personal Protective Equipment**
 - Respiratory
 - Skin
 - Eyes/Head/Feet, etc.



Problems with OSHA Regulations

- Not all workers are covered
- Rulemaking mired in drawn out procedures and politics
- Subject to court interpretations
- Exposure levels are based on 1968 guidelines
- Guidelines not necessarily based on health outcomes
- Often no margin of safety
- Workers affected at concentrations below the guidelines
- Acute effects only (reproductive; neurological; musculo-skeletal)

Future of Work

- Changes in demographics
- More service, high technology in the US
- Decentralized, self structured workplaces
 - More collaboration, cooperation
- Temporary or contract workers (work/life balance?)
- Fewer unions
- Workplace vs. Environmental Regulation in conflict
- International differences in control practices and regulations

Silverstein paper

“Ergonomics and Regulatory Politics: the Washington State Case”, *AJIM*; 50:391–401 (2007).

- Musculo-skeletal risks (what are they and what is the burden to workers, employers, and insurance system?)
- Regulatory Process
- Alternatives to regulations