

OSHA Ergonomics Technical Update

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Technical Support

Ergonomics

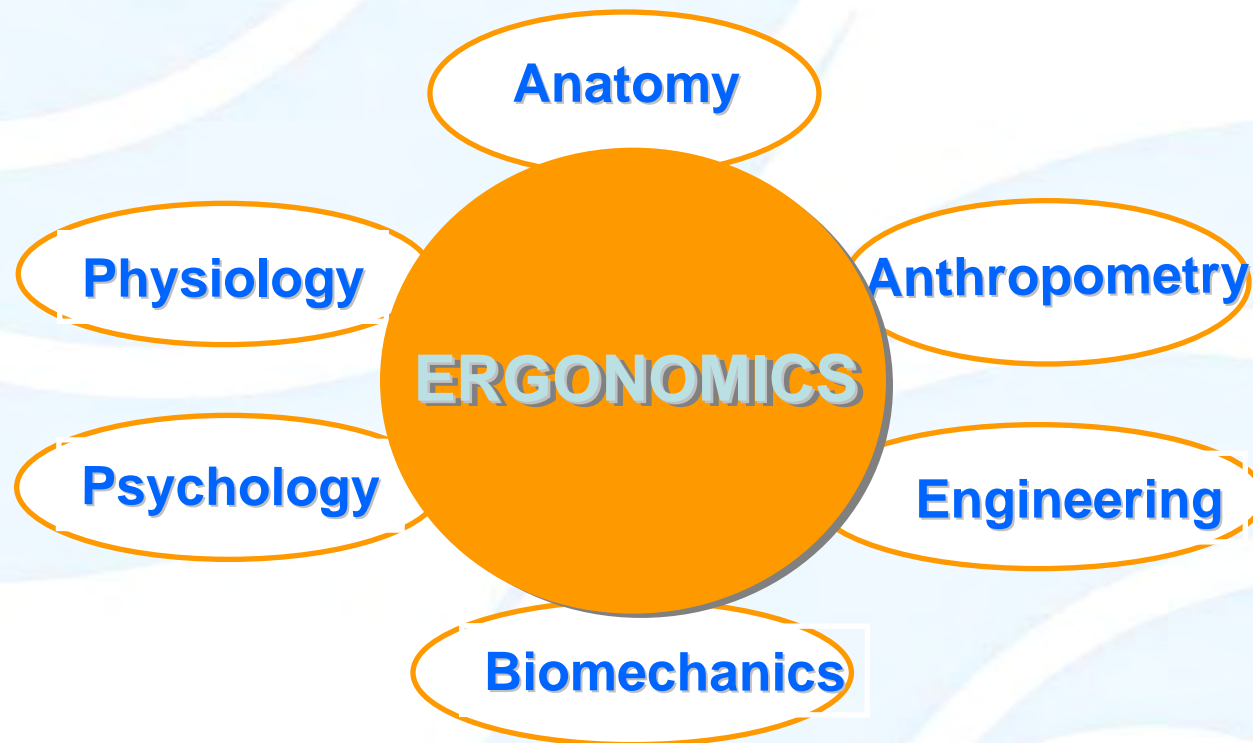
- **A body of knowledge about human abilities, limitations and other characteristics and the application of this information to the design of tools, machines, systems, tasks, jobs and environments for safe, comfortable and effective human use.**

(Alphonse Chapanis)

- **The science of fitting workplace conditions and job demands to the capabilities of the working population.**

(NIOSH, 1997)

Ergonomics: Multidisciplinary Science



***GOAL – to fit the job to the person
vs. fitting the person to the job!***

Musculoskeletal Disorders: MSDs

- **Disorders of the muscles, nerves, tendons, ligaments, joints, cartilage, or spinal disks**
- **Disorders that reflect gradual or chronic development**
- **Disorders diagnosed by the medical history, physical examination or other medical tests**
- **Disorders with several distinct features or defined by the location of the pain**

Work-Related MSDs:

WMSDs

- Disorders to which the work environment and the performance of work contribute significantly**
- Disorders that are made worse or longer lasting by work conditions**

WMSDs: National Problem

- **The most prevalent lost-time injuries and illnesses in every industry**
- **The most costly occupational problems**
- **Span diverse workplaces and operations**
- **Cause pain and suffering among workers**
- **Decrease productivity and the quality of products and services**

WMSDs: Magnitude of the Problem

- ✓ **70 million physician office visits annually**
- ✓ **130 million total health care encounters**
- ✓ **Nearly 1 million people took time away from work to treat or recover from WMSDs**
- ✓ **Economic burden - \$54 billion annually**

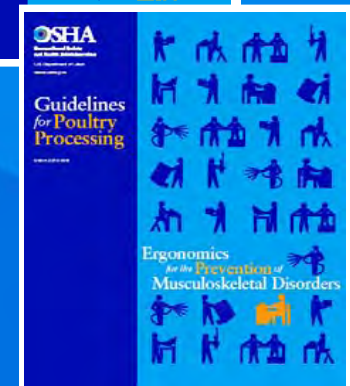
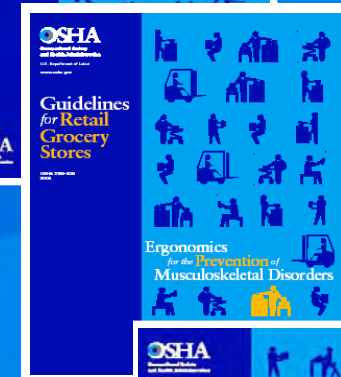
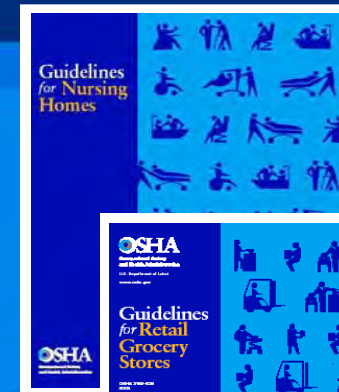
OSHA Comprehensive Ergonomics Plan

- ❖ Industry-specific guidelines
- ❖ Enforcement measures
- ❖ Compliance assistance
- ❖ Ergonomics research



Industry-Specific Guidelines

- ❖ March, 2003: Ergonomics Guidelines for Nursing Homes
- ❖ May, 2004: Ergonomics Guidelines for Retail Grocery Stores
- ❖ September, 2004: Ergonomics Guidelines for Poultry Processing



Guidelines vs. Standards

- **Advisory in nature**
- **Informational in content**
- **Not a new standard or regulation**
- **Do not create any new OSHA duties**

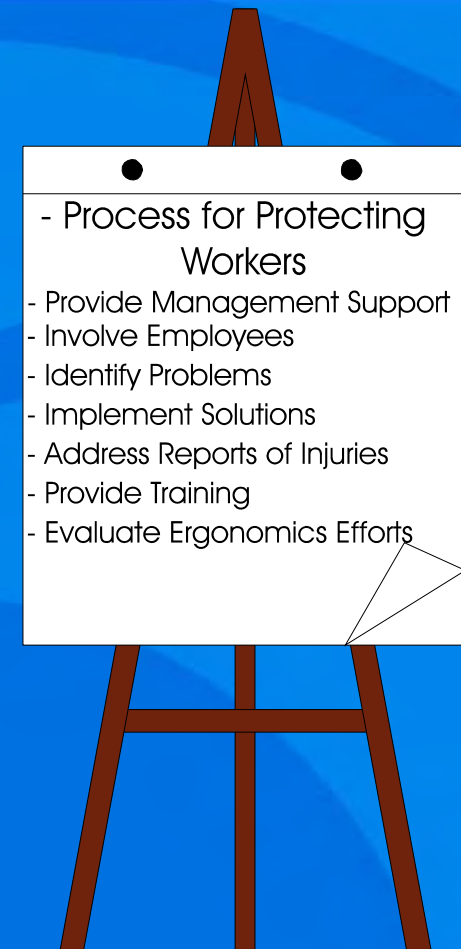
The Guidelines will not be used for enforcement.

Ergonomics Guidelines: Structure

- **Introduction**
- **Process for Protecting Workers**
- **Identifying Problems**
- **Implementing Solutions**
- **Training**
- **Additional Resources**

Process for Protecting Workers

- Provide management support
- Involve employees
- Identify problems
- Implement solutions
- Address reports of injuries
- Provide training
- Evaluate ergonomic efforts



Ergonomics Program:

Benefits

- Fewer injuries among workers
- Reduced workers' compensation costs
- Additional benefits:
 - Reduced staff turnover and related costs
 - Improved employee morale
 - Increased job satisfaction

Industry-Developed Ergonomics Guidelines

- ▶ **American Apparel and Footwear Association**
- ▶ **American Furniture Manufacturers Association**
- ▶ **National Telecommunication Safety Panel**

<http://www.osha.gov/SLTC/ergonomics/outreach.html>

Enforcement

- **Coordination of inspections with a legal strategy for successful enforcement**
- **Target serious ergonomics violations**
- **Use special ergo inspection teams to work closely with legal experts**

Enforcement:

General Duty Clause

OSH Act 1970, Section 5(a)(1):

“Each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.”

General Duty Clause: Elements

- ✓ Is there exposure to a hazard?
- ✓ Is it a recognized hazard?
- ✓ Is it likely to cause death or serious injury?
- ✓ Is there a feasible means of abatement?



OSHA Ergonomics Enforcement

The Department places special emphasis on industries using the General Duty Clause where ergonomics hazards exist and employers are not making good faith efforts to prevent injuries

Enforcement: Update

- **April 2002 through August 31st 2007:**
 - **Conducted 4,034 inspections involving MSDs**
 - **17 citations to 14 companies**
 - **Sent 571 Ergonomic Hazard Alert Letters**
 - **Sent 103 letters acknowledging employers' efforts**

Enforcement

▶ Enforcement activity initiated in several ways:

- Ergonomic LEPs
 - Auto-parts manufacturing
 - Hospitals
 - Meatpacking
 - Warehousing
- SST
- Complaints/referrals

Enforcement

- ▶ **Ergonomic enforcement is a process:**
 - **CSHO evaluates a site**
 - **If the AO believes the case should go forward, the REC is contacted and if the RO (with RSOL) agree...**
 - **Ergonomic Response Team (ERT)**
 - **Consists of RECs, agency ergonomists, industrial hygienist, industrial engineer, attorneys, physicians, and others**
 - **All with ergonomics experience.**
 - **ERT reviews potential cases and makes recommendations to the Assistant Secretary**

Enforcement

- ▶ **Inspection outcomes:**
 - No further action
 - Acknowledgement letter
 - Ergonomic Hazard Alert Letter (EHAL)
 - Citation

Enforcement

▶ Citations:

- All cases have been settled
 - 11 Nursing Homes
 - 2 Beverage distribution companies
 - 2 Grocery distribution warehouses
 - 1 Printing company
 - 1 Metal door fabrication factory
- 3 cases (6 citations) resulted in CSAs
 - Approximately 72,000 employees

Enforcement: EHALs Follow-up Policy

Singed: April 2007

Purpose: ...to determine whether identified hazards and deficiencies have been addressed

Scope:
...applies to any ergonomic inspection for which an ergonomic hazard alert letter (EHAL) has been issued

EHALs Follow-up Policy: Initial Contact

- **Phone call**
- **Explain this is follow-up to original inspection**
- **Attempt to speak to original management contact**
- **Fax original EHAL and Follow-up letter**
- **Request:**
 - **Measures taken to address EHAL**
 - **OSHA 300 logs since close of inspection**
 - **Estimated # of full-time employees or work hours for exposed employees for time period corresponding to OSHA 300 logs**

Outreach and Assistance

Provide tools to help workplaces reduce and prevent ergonomic injuries

- **Provide expertise to assist businesses & workers**
- **Support programs through training grants, curriculum development and other means**
- **Design compliance assistance tools, new partnerships and recognition programs**
- **Encourage others to develop best practices**

Outreach and Assistance: Increasing Resources

- Providing general and guideline-specific outreach, assistance and support
- Featured resources and programs:
 - OSHA Website
 - Cooperative Programs
 - Training and Education



Outreach and Assistance: OSHA's Website



The screenshot shows the OSHA website interface. At the top, it features the U.S. Department of Labor Occupational Safety & Health Administration logo and the URL www.osha.gov. A search bar is present with a 'GO' button and links for 'Advanced Search' and 'A-Z Index'. Below the header, there are several sections:

- Safety and Health Topics: Ergonomics**: A section with a globe icon and the heading 'OSHA Effective Ergonomics: Strategy for Success'. The text describes a four-pronged comprehensive approach to ergonomics designed to address musculoskeletal disorders (MSDs) in the workplace.
- Announcements**: A yellow-bordered box containing two bullet points:
 - OSHA has issued [draft guidelines for Nursing Homes](#).
 - OSHA to develop Ergonomics Guidelines for Retail Grocery Stores, Poultry Processing [[More...](#)]
- Guidelines**: A section with a puzzle-piece graphic. The text states: 'Guidelines, OSHA is developing industry-specific or task-specific guidelines for a number of industries based on current incidence rates and available information about effective and feasible solutions.' Below this is the URL www.osha.gov/SLTC/ergonomics/index.html.
- Additional Resources**: A list of links including News Room, What Others are Saying, FAQs, State Plan States, and eTools.
- Four-Pronged Approach**: A numbered list: 1. Guidelines, 2. Enforcement, 3. Outreach and Assistance, 4. National Advisory Committee.

Any company listed on the site or its products does not constitute endorsement by OSHA. Moreover, citations to Web sites external to OSHA do not constitute OSHA endorsement of the sponsoring organizations or their programs and/or products. Furthermore, OSHA is not responsible for the content of those Web sites.

Industry-Specific Ergonomics eTools

- Ergonomics: Solutions for Electrical Contractors
- Baggage Handling
- Computer Workstations
- Grocery Warehousing
- Poultry Processing
- Sewing
- Printing
- Healthcare
- Beverage Delivery

<http://www.osha.gov/SLTC/ergonomics/outreach.html#eTools>

Outreach and Assistance: Training and Education

OSHA has developed training programs to address ergonomic hazards:

- **Course 225 – Principles of Ergonomics Applied to WMSDs**
- **20 education centers**
- **Training is key to safety and health**



Ergonomics Research

- **National Advisory Committee on Ergonomics (NACE)**
- **Research gaps identification: application of ergonomic principles in the workplace**
- **Work with NIOSH and through NORA: encourage research in needed areas**

Ergonomics Research: NACE Recommendations

- **Develop guidelines for 16 industries:**
 - Nursing Homes* ● Trucking & Courier ● Air Transport Scheduled ● Hospitals ● Groceries - Wholesale ● Motor Vehicle-Equipment ● Motor Vehicles and Car Bodies ● Plumbing, HVAC ● Department Stores ● Retail Grocery*
- **Best practices and success stories**

Ergonomics Research: NACE Recommendations

■ Gaps in research about MSDs

- Examine validity of techniques used to diagnose MSDs.
- Examine the role of psychosocial factors.
- Develop animal models to study the effects of physical loading on living tissues.
- Examine validity and reliability of existing exposure assessment methods.
- Determine economic impact of ergonomic interventions.
- Address multi-factorial causes of MSDs.
- Describe natural history of MSDs.
- Study factors concerning causation, diagnosis, duration of disability, and other outcomes related to MSDs.

Ergonomics Research: NACE Recommendations

■ Guiding points for the future

- Ergonomics is a noun, not an adjective. -...it is used as such in formal documents.
- Hazards exist in the form of poorly designed work practices and/or workplaces.
- Ergonomics is a process that can be beneficially used to address job and workplace design. -... Improved safety characteristics occur in concert with productivity improvements.
- ***Once workers no longer need to devote maximum energy to “overcoming” the demands of their work practices and/or workplaces, they can devote those same energies to productivity and quality aspects of their jobs.***
- The pursuit of a single definition of MSDs has not reached consensus.
- OSHA should continue development of guidelines independent of any final definition of MSDs.

Ergonomics Research: NACE Recommendations

■ Guiding points for the future

- MSDs are a consequence of exposures to risk factors of multi-factorial nature. - Although the exact cause of specific MSD may not be known, and the precise effectiveness of an intervention may not be predictable, objective of ergonomics is to reduce... the demands ...of doing the work by controlling these exposures. - To this end a number of tools and guidelines may be useful. - ***Ergonomics should be included in comprehensive occupational safety and health programs.***
- It must be recognized there are non-occupational components that also contribute to the development of MSDs.
- ...these components are best addressed by educating the workforce concerning such non-work hazards.

www.osha.gov/SLTC/ergonomics/recommendations.html

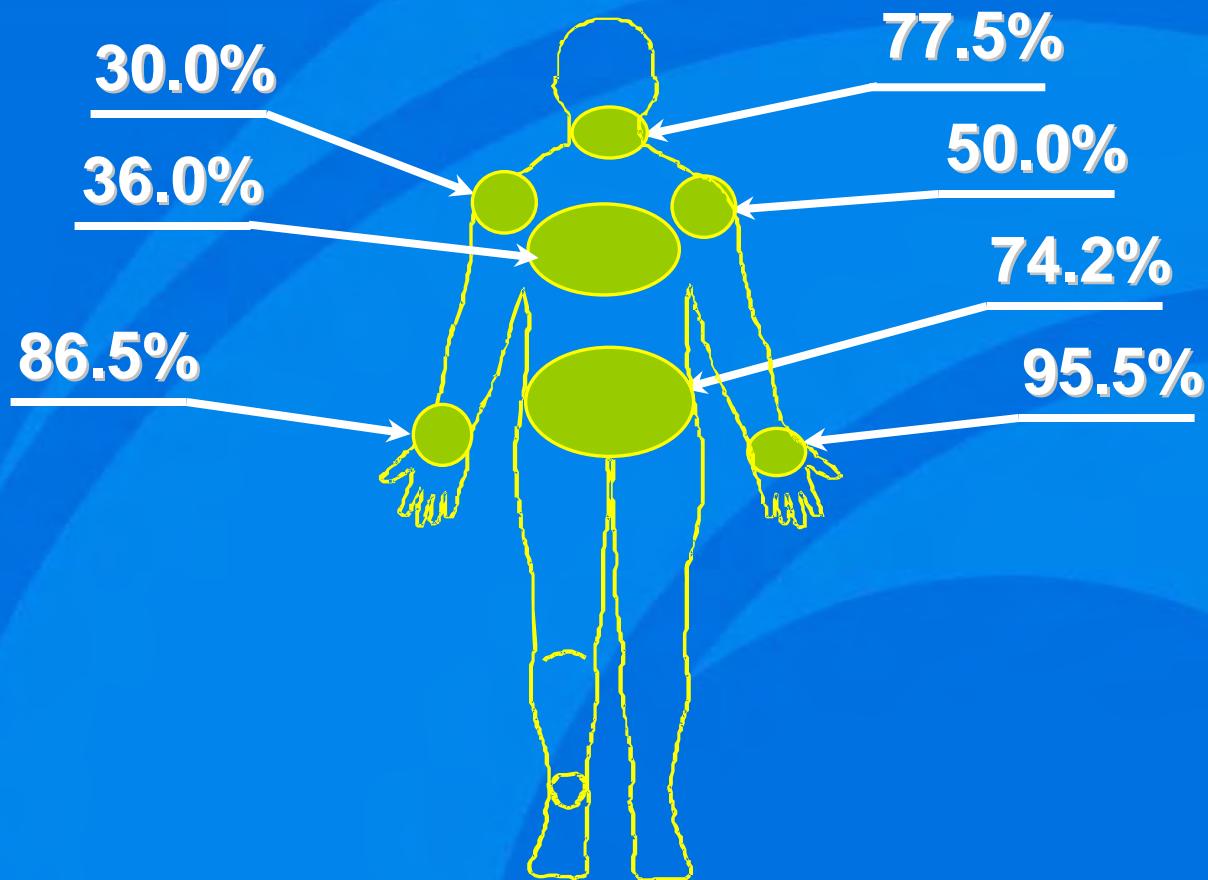
Ergonomics: Comprehensive Approach

Goals:

- ❖ Decrease ergonomic hazards
- ❖ Reduce injuries and illnesses
- ❖ Help employers prevent MSDs
- ❖ Ensure flexibility and encourage innovation



Telecommunication Industry: Prevalence of WMSDs



Fagarasanu, M. and Kumar, S. 2006. WORK, 27:137-142

Call Centers: New Area for Ergonomic Research

- Call Center
- Contact center
- Customer interaction center
- Call Centre

“A work environment in which the main business is conducted via telephone while simultaneously using a VDT Workstation”



(HSE 2006, UK)

Call Centers: Risk factors for MSDs

- Awkward postures
- Static postures
- Repetitive movements
- Use of excessive force
- Contact stress
- High workload
- Task complexity
- Time pressure
- Routine work
- Low job control
- Performance monitoring
- Customer diversity
- Mental stress

Call Center Ergonomics: Recommendations

- ▶ Improved workstation design
- ▶ Proper placement of input devices
- ▶ Ergonomics training
- ▶ Adequate pauses and rest breaks
- ▶ Adequate environmental conditions
- ▶ Headset selection
- ▶ Stretching

Call Center Ergonomics: Additional Information

- Health and Safety Guidelines for Call Centres. Catalog No. 589. WorkCover New South Wales. Australia, 2003.
- Code of Practice: Occupational Safety and Health in Call Centres. Commission for Occupational Safety and Health, Western Australia, 2005.
- Advice regarding call centre working practices. Health and Safety Executive, UK, 2006.
- Ferreira M. et al., 2002. Computer-telephone interactive tasks: predictors of MSD according to work analysis and worker's perception. *App Erg* 33: 147-153
- Smith M. et al., 2003. Do ergonomics improvements increase computer workers' productivity: an intervention study in call centre. *Erg* 46(1-3): 3-18.
- Norman K. et al., 2004. Working conditions and health among female and male employees at a call center in Sweden. *Am Jour Ind Med* 46:55-62.
- Rocha L.E. et al., 2005. Risk factors for MSDs among call center operators of a bank in San Paulo, Brazil. *Ind Health* 43:637-646.

Utility Cover Removal: Industry-Specific Problematic Task

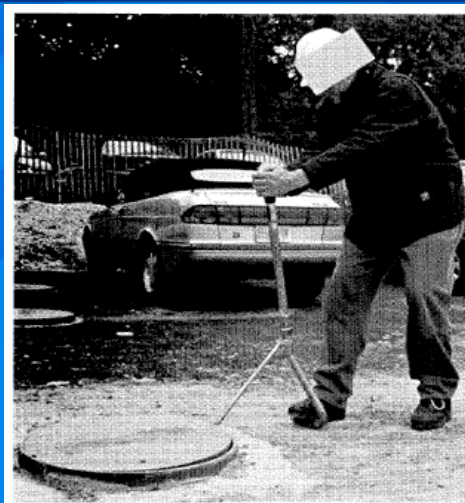
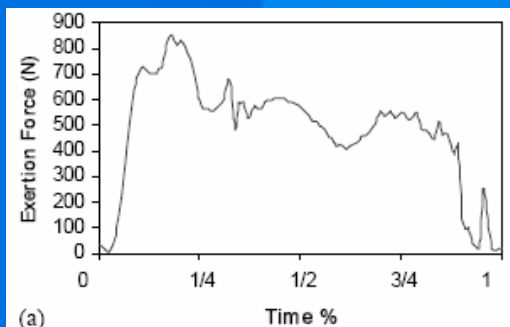
- Heavy manual lifting
- Forceful exertions
- Excessive pulling force
- High speed jerking movements
- Awkward postures
- Unfavorable environmental conditions



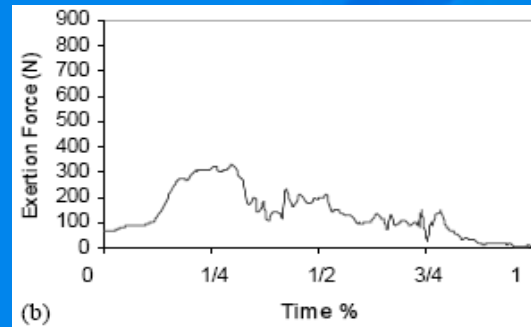
Utility Cover Removal: Effect of Tool Design



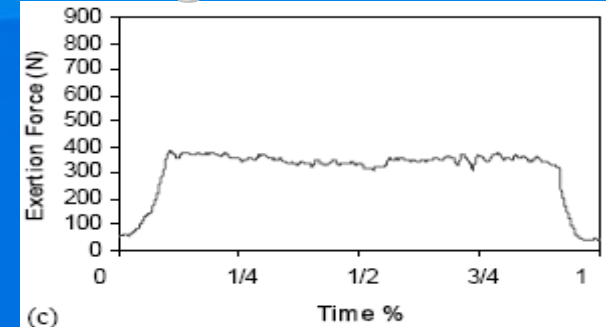
J – hook tool



Fulcrum bar tool



Magnetic lift tool



Chien-Chi Chang et al., 2003. Investigating the effect of tool design in a utility removal operation. *Int Jour Ind Erg* 32:81-92

Potential Ergonomic Solutions: Kneeling Tasks



Balance snapsit

www.balansprodukter.se

Potential Ergonomic Solutions: Wire Stripping

Kinetic Reflex Wire Stripper

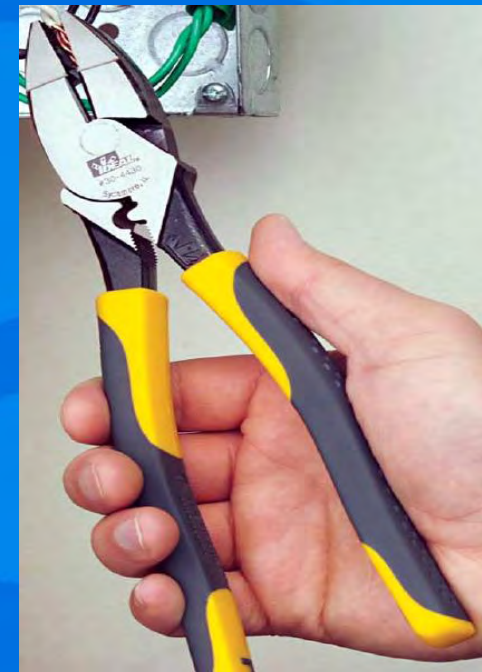


“Bend the tool not the hand”

www.idealindustries.com

Potential Ergonomic Solutions: Cutting

WireMan Pliers



Electrician's Job Saw

Potential Ergonomic Solutions: Screwdriving

Black & Decker Cordless
Pivot Screwdriver



“Bend the tool not the hand”

CRAFTSMAN High Performance Screwdriver

Potential Ergonomic Solutions: Low Height Tasks



Walkstool

www.walkstool.com



**Adjustable
Work Stool**

**Pneumatic
Stool**



Potential Ergonomic Solutions: Handling Wire Reels



Hand Truck Wire Cart



www.greenlee.com

Potential Ergonomic Solutions: Lifting Tasks

Design features:

- Mobile with multiple speeds
- Compact and easy to stow or transport
- Full range of motion
- Operator controls movement
- Leveling and stability provided by jacks
- Gripping attachments for specific tasks
- Power choices: on-board battery, compressed air or 110-V cord
- Braking on lifting arm for load control
- Loads lifted: 50 – 600 lbs



Mobile manipulator

DHHS (NIOSH) Publication No. 2007-111

Additional Ergonomics Resources

- Ergonomics
- Human Factors
- International Journal of Industrial Ergonomics
- American Journal of Industrial Medicine
- Journal of Occupational & Environmental Hygiene
- Journal of Occupational Rehabilitation
- WORK: Journal of Prevention, Assessment and Rehabilitation
- Applied Ergonomics
- Ergonomics in Design

Additional Ergonomics Resources

- NIOSH: Ergonomics and MSDs
<http://www.cdc.gov/niosh/topics/ergonomics/>
- European Agency for Safety and Health at Work
<http://osha.europa.eu/info>
- Health & Safety Executive, UK <http://www.hse.gov.uk/>
- Canada's National Occupational Safety & Health Resource <http://www.ccohs.ca/>
- Cornell University Ergonomics Web
<http://ergo.human.cornell.edu/>
- University of Michigan Center for Ergonomics
<http://www.engin.umich.edu/>

Safety and Health Add Value

- To Your Business
- To Your Workplace
- To Your Life



The Challenge

- Adding value
- Working together
- Moving the dialogue forward
- Reducing ergonomic injuries





**Occupational Safety and
Health Administration**

1-800-321-OSHA

www.osha.gov