



# A DoD Frontier

## Ergonomic Safety for Patients and Staff

Presentation for the Applied Ergonomics  
Conference and Expo 2009

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# DoD Population Served \*

- Active Duty
  - In garrison
  - In theater
- Civilians – multiple occupations
- ‘Beneficiaries’ = family members, retired active duty, National Guard/Reserve when on active duty or retired, survivors
  - Special Needs family members with congenital challenges

\* 9 + million

# Business Case

- Built Environment should reflect ‘healing design’
- Safe Patient Handling and Movement (SPH)
- Computer/Electronic Accommodations Program (CAP)

# John Kotter's Change Theory

- Establish a sense of urgency
- Create a coalition
- Develop a clear vision
- Empower people to clear obstacles
- Secure short-term wins
- Consolidate and keep moving
- Anchor the changes

# Setting the Stage for Change

## Sense of Urgency

- Planning for the Base Realignment & Closure Act (BRAC)
  - Merger of Walter Reed Army Medical Center with National Naval Medical Center
  - Merger of Wilford Hall Air Force Medical Center with Brooke Army Medical Center
  - Replacement hospital at Dewitt Army Community Hospital
- Literature review and data review of health care staff injuries related to patient handling and movement at our hospitals

## Literature Review

### Hidden Epidemic – Healthcare Workers at Risk

- Occupational back injury is the second leading cause of occupational injury in the United States [NIOSH]
- Nursing staff are consistently among the top 10 occupations for work-related musculoskeletal disorders
- Among healthcare personnel, nurses have the highest rate of back pain, with an annual prevalence of 40-50%.

Edlich, RF, KL Winters et al

- **Underreporting** of injuries in nursing is common since they perceive that back pain is an inevitable part of nursing practice and they are duty bound to work to care for patients.

Nelson, A., & Baptiste 2006

- Even **more underreporting** among military nurses due to the more stoic culture to ‘tough it out’ (warrior ethos)

Personal communication, Mary Matz, VAH 2007

## Hidden Epidemic – Healthcare Workers at Risk

- During the course of a shift, a nurse typically lifts a cumulative weight of 1.8 tons
- Executed from awkward positions – bending and reaching over beds
  - Impacts quality of care
  - Patient Safety

Nelson, A., & Baptiste, A. S. (2006) Ibid.

- Physical therapists and radiology technicians and interventional radiologists also at risk.

# Hidden Epidemic – Healthcare Workers at Risk

## Perfect Body Mechanics are Not Enough

- Maintenance of an awkward posture places abnormal strain on a normal back. Patients don't come with handles...**Unfortunately, nursing personnel frequently work in awkward positions.** When two nurses lift a patient weighing 140 pounds, each is lifting approximately 70 pounds.



## Hidden Epidemic – Healthcare Workers at Risk

- Serious problem in Nursing
  - Recruiting
  - Retention
- “Estimated each year that 12% of nursing personnel will consider a job transfer to decrease risk—another 12-18% will actually leave the nursing profession due to **chronic back pain**”

Nelson, A., & Baptiste, A. S. (2006). Op.cit.

# Successful Interventions

- Ceiling lifts significantly reduced injury and discomfort to neck, shoulders, back, hands and arms of care staff.
- Compensation costs for lifting and transferring tasks reduced 69% and 42% of incidence of Musculoskeletal Disorders
- Cost around \$7,000 – \$9,000 (payback 1.98 to 3.85 years)

Engst et al 2005

# Evidence Based Design for Staff and Patient Safety

- Body of knowledge regarding occupationally related musculoskeletal disorders (MSDs) have shown that excellent body mechanics **are not enough** to mitigate injuries related to patient movement and handling by healthcare staff.
- Studies led by VAMC Tampa have shown significant savings in FECA & medical costs - over 200K per year following patient care ergonomic training

Edlich, et al, April 2001.

deCastro, et al , 2006

# Successful Interventions

## Study of 31 hospitals in Washington State

- Patient handling injury claims decreased by 43% between pre and post implementation (between 2000 and 2004)
- Time lost frequency rate decreased by 50%  
Charney, et al 2006
- Peace Health Installed ceiling lifts and reduced annual costs of patient handling injuries by 83%  
Joseph et al 2006

## Successful Intervention for Intensive Care Units

- Following a precipitous rise in musculoskeletal injuries from 2000 to 2001 to 130%, an xy gantry ceiling lift was installed in the Richmond Hospital ICU.
- The xy gantry system allows repositioning of the patient, up and down and side to side, assisted side lying for skin care, transfer from bed to chair or stretcher, and portable x-rays.
- Followup showed decreases in pain, fatigue and frustration at the end of a 12 hour shift; decreased doctor's visits, medication use, and time off from work due to injuries caused by bedside care or transfers. Claims were reduced by 70%.
- Amount of nurses to turn a patient has been reduced from four to two (one to manage the tubes)

Silverwood et al, 2006

Most Common Work-Related Musculoskeletal Disorders  
(WMSD) at WRAMC \*  
Lessons learned...

- Back injuries are the number one WMSD
- Shoulder/upper extremity injury-carpal tunnel, rotator cuff, sprains and strains
- Neck injury
- Lower extremity injury- knee and ankle sprain and strain

\* McCoskey, 2004

## Patient Handling Study WRAMC 2002

- First and foremost, must have active and sustained support of leadership
- Must have someone actively involved on each high risk unit. This person should act as the program champion.
- The approach must be comprehensive and should include the following:
  - Administrative controls
  - Behavioral controls
  - Engineering controls

## Recommendations and Observations Based on WRAMC Study

- Incorporate patient handling into documentation process so there is a record of patient dependency and what equipment is recommended. This should include tracking and follow up by supervisors.
- Start with a unit that has a fairly stable supervisory and employee population.
- Finally, safe patient handling and movement should be part of the nursing education process and ongoing for radiology technicians, physical therapists and all new staff on units with high risk patients with dedicated space in MTFs to learn how to use equipment
- Communication plan to ensure reduction in injuries and incorporation of needed equipment in new and renovated MTFs.



## Exploring Incidence of Injuries

- Military – Not covered by Federal Employees Compensation Act (FECA) due to disability provisions in Title 10
- Contract employees – Not covered by FECA
- Civilian – Covered by FECA

# Federal Employees Compensation Act

- Applies *only* to federal civilian workers
- Excludes active duty, reserve, and contract workers
- Reporting required by law
- Data maintained by DoD (USD/P&R)
  - Data are aggregated annually from 1 July to 30 Jun

# Sample of FECA Data

1/72

**Date of  
Injury**

injury occurred  
1/72 –  
35 yrs of cost

\$35,517 x 35 yrs

Table removed to avoid disclosure of protected health information

## Civilian Staff Back Injuries [FECA] at Five MTFs 2002-2006

MTF	2002	2003	2004	2005	2006	5 yr sum	Initial injury
A	168,326	195,598	196,650	226,796	226,035	1,013,403	5/13/75
B	199,139	152,637	122,882	193,729	136,006	804,393	9/5/73
C	147,896	149,607	174,351	292,379	367,217	113,1450	12/12/71
D	571,391	548,205	523,873	556,149	756,388	295,7006	5/13/69
E	932,259	940,571	976,851	1,134,478	946,127	4,930,286	11/17/69

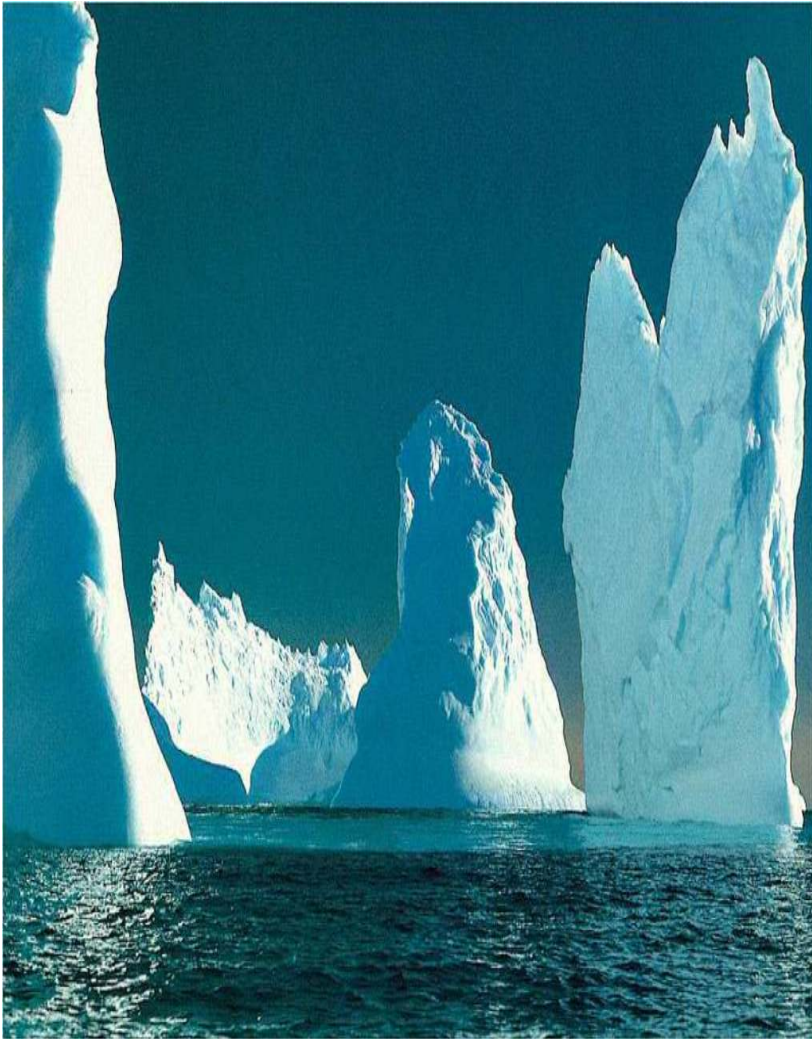
\$10,836,537

## The Million Dollar Employee...

- A 35 year old, GS 7 Step 5 employee, will receive over \$1,600,000 in compensation if they never return to work.\*
- \* Adjusted for inflation, based on a life expectancy of 70. Estimated amounts are tax-free and do not include medical expenses.

(DoD FECA brief payout trends 1991-2006)

# The Hidden Costs of Injuries



## Direct Cost

- Compensation payments
- Medical Cost

## Indirect/Hidden Cost of Injuries

- Replacing employees
- Investigation time
- Supervision time
- Training
- Staff morale
- Possible patient injury
- Disruption of work team
- Overtime paid

# Creating a Coalition

- Presentation of Federal Employment Compensation Data to DoD Ergonomics Committee
- Presentation to Chief Nurse at NNMC
- Presentation at visioning session with architects and opinion leaders at DeWitt Army Community Hospital
- Collaboration with The Center for Health Design

## Safe Patient Handling and Movement Endorsement from National Bodies

- Joint Commission [Current standards, March 2007]
- American Hospital Association American Organization of Nurse Executives [May 2007]
- American Nurses Association Position Statement [2003]
- National Institute for Occupational Health and Safety
- American Physical Therapy Association, Association of Rehabilitation Nurses, and Veterans Health Administration [White paper, 2005]
- American Institute of Architects 2010 Guidelines



First, do no harm...

USD(P&R) Mission - ensure human resources are recruited, trained, capable, motivated, and ready to support the DoD mission"... Further, goal 14 of the strategic plan is to "reduce injuries for our **civilian employees and military members**"...

# The Clear Vision

## Evidence-based Design for the Built Environment

Ergonomics/reduction of staff musculoskeletal injuries

- Provide ceiling lifts for all intensive care unit (ICU), Operating Room (OR) and Radiology beds, and for 50 percent of medical-surgical and casualty care beds
- Improve the quality and safety of healthcare

Improve Quality and Safety and Create a Positive Work Environment

- Reduce patient falls
- Decrease back pain and injuries related to patient handling and movement

# Empowerment to Clear Obstacles

## Dr. Winkenwerder, Assistant Secretary of Defense (Health Affairs)

- “I request that you ... apply patient centered and evidence based design principles across all medical MILCON construction projects. A growing body of research has demonstrated that the built environment can positively influence health outcomes, patient safety, and long-term operating efficiencies ...” --

22JAN07

# DoD Ergonomics Partners

- The Center for Health Design
- The DoD Patient Safety Center
- Department of Veterans Affairs
- Department of Labor
- Many others through Computer/Electronic Accommodation Program (CAP)
- The Epidaurus (Healing Design) Working Group

## Short-Term Win Evidence-based Design (EBD) for the Built Environment

- Four key areas for the National Capital Area Base Realignment and Closure Designs  
(merger of Walter Reed Army Medical Center with the National Naval Medical Center)

Air purification – HEPA filtration

Facilitation of Family involvement in care

Spirituality spaces

Ergonomics/reduction of staff  
musculoskeletal injuries

## Short Term Win

- Install ceiling lifts in all newly designed/replacement MTFs. Selection of specific sites to be informed by Ergonomics study being conducted by CHPPM
- Purchase lateral transfer equipment for other types of patient movement
- Develop policies and training doctrine to support safe patient handling and movement on ongoing basis.
- Endorsed by Army AMEDD Chief of Staff – pilot at Madigan Army Medical Center, FT LEWIS, WA to research effectiveness

# Minimal Coverage for Ceiling Lift System

Clinical Area	Minimal Coverage	Preferred Configuration
Critical Care Units	100%	Traverse
PACU	100%	Traverse
Procedure area (GI, cystoscopy)	100%	Traverse/straight
Morgue	100%	Traverse/straight
Med/Surg Units	70%	Traverse
MRI	100%	Straight track in adjacent MRI patient transfer areas
Radiology (x-ray, CT, Nuclear Medicine)	50%	Traverse/straight
Outpatient/primary Care	1 expanded capacity/bariatric lift	Traverse
Emergency Dept/Urgent Care	50%	Traverse over multiple bays or in private rooms
Nurse Training Area	1 Ceiling Lift	Straight

# Making it Happen

## Consolidate and Keep Moving

- Communication for understanding and buy-in, short-term wins & continuing partnerships with other organizations
- Joint Incentive Fund Proposal – DoD and VA jointly occupied facilities



# Anchor the Change

- Publish results of pilot studies
- Plan assessment of military members who sustain injuries related to patient movement and handling
- Prepare 'doctrine' for DoD

# Computer/Electronic Accommodations Program

- Workplace Ergonomics
- Wounded Service Member Initiative
- Workforce Recruitment Program

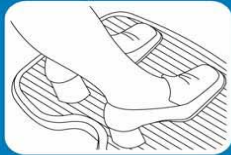
# CAP Ergonomics

- Fitting the job to the person – workplace evaluation, design of workplace, job tasks, equipment and processes.
- Recommend all furniture and other accessories are adjustable to meet individual's body size, type and individual seating and working preferences – all decrease risk of injury

# CAP Ergonomic Assessments

- The Workplace Ergonomics Reference Guide.

[www.tricare.mil/CAP/Ergo\\_Guide/CAP\\_Ergo\\_Guide.pdf](http://www.tricare.mil/CAP/Ergo_Guide/CAP_Ergo_Guide.pdf)



## Workplace Ergonomics Reference Guide

A Publication of the Computer/Electronic Accommodations Program

[www.tricare.mil/CAP](http://www.tricare.mil/CAP)

Real Solutions for Real Needs

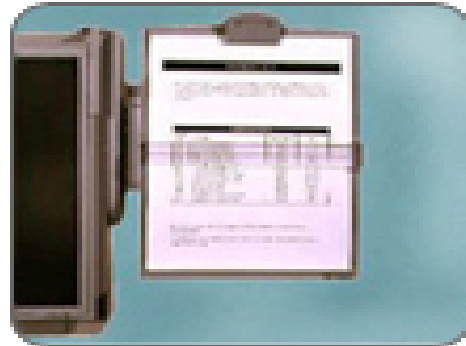


**U.S. Department of Defense**  
Office of the Assistant Secretary for Health Affairs  
TRICARE Management Activity

# CAP Workplace Ergonomics

- Ergonomic Checklist
- Ergonomic Needs Assessment
  - Chair
  - Prevention of posture problems
  - Workstation
  - Lighting
  - Healthy work practices
  - Accessible work environment
- Ergonomics and Assistive Technology
- Telework

# Assistive Technology



# Assistive Technology for Wounded Service Members

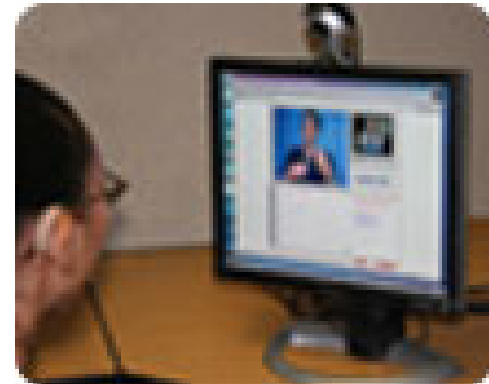
- DoD Instruction 6025.22 September 9, 2008
- <http://www.dtic.mil/whs/directives>
- Support. Equip. Empower
- Collaboration with Department of Labor to enable wounded warriors to return to work with appropriate accommodations
- Public Law 109-364 – members can retain the CAP upon separation from active service
- [www.tricare.mil/cap/Documents/public\\_law\\_109-364.pdf](http://www.tricare.mil/cap/Documents/public_law_109-364.pdf)



# DoD Ergonomics for Wounded Service Members



Computer/Electronic  
Accommodations  
Program



# Computer Electronics Accommodation Program (CAP)

- Workforce Recruitment Program accommodates summer or full time employment for students with disabilities.
- April 1 – Disability Employment Innovation Days – hands free technology for those with limited mobility
- Assistive technology including workstation configuration
- Dexterity – disabilities that impact the range of motion from minor to major finger movements and include: quadriplegia, paraplegia, individuals with multiple sclerosis and cerebral palsy, and individuals who have developed disabling conditions such as carpal tunnel syndrome and tendonitis.

# Contact Information

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