The Ergonomics of Patient Handling

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Major Healthcare Trends

• Pressure to Control Costs
• Emphasis on Reducing Length of Stay
• Attention to Patient Safety
• Focus on Nursing Staff Retention/Recruitment
• Accountability
• Increasing Competition For Customer Segments
• Greater Involvement of Family in Care Process
Barriers to Improving Caregiver Safety

- Staffing shortages
- Aging workforce
- Increasing patient acuity
- Increasing population weight/size
Epidemiology Data

- Rate of injuries in Hospitals is 9.7 per 100 FTE
- Between 59 and 66% of injuries are strains/sprains
- Approximately 80% of lost time and injury costs are the result of sprains and strains (Bureau of Labor Statistics Data)
- Point prevalence of back pain among nurses is 17%
- Nurses who frequently lift patients are 3.7 times more likely to be injured than other nurses (Jensen, 1990)
- Most injuries occur during planned patient transfers, not emergencies. (Engkvist et al, 1998)
Occupation losing time from work due to work-related musculoskeletal disorders:
#1 Nursing aides, orderlies, attendants
#7 Registered Nurses

Nature of injury:
#1 Sprains and strains

Event or Exposure:
#1 Overexertion

Source of injury/illness:
#1 Health Care Patient

Part of Body Injured:
#1 Trunk (back)
Task Analysis

The most common patient handling tasks that cause injuries in acute care settings include:

- Repositioning a patient in the bed
- Transferring a patient between the bed and a chair
- Turning the patient in the bed
- Lateral transfers in and out of a wheelchair
- Transferring a patient to or from a commode, toilet, or shower chair
- Pushing a bed
- Assisting a patient into or out of the bed
- Lifting a patient from the floor
- Weighing a patient

Patient Handling Injuries at 16 Acute Care Facilities
Percent of Injuries Occurring During Each Task

- Repositioning in bed
- Bed to Chair/Chair to Bed
- Lateral transfers
- During Ambulation
- Toileting
- Pushing beds
Common Causes of Patient Handling Injuries
Percent of Injuries Occurring During Each Task

Data Analysis and Summary from XXXXX Hospital
Common Causes of Patient Handling Injuries
Percent of Injuries by Body Part

Data Analysis and Summary from XXXXX Hospital
Controlling Costs

Any town Hospital

- Annual direct costs $425,000
- Annual indirect costs $1,275,000
- Annual total costs $1,700,000
Patient Handling
Primary Risk Factors

- Force
- Position
- Duration

Ergonomics efforts in health care have traditionally focused on measuring and reducing force.
Body Mechanics Training

- Questionable applicability to patient care
  - Reaching and lifting loads far from the body
  - Lifting heavy loads
  - Twisting while lifting
  - Unexpected changes in load demand during the lift
  - Reaching low or high to begin a lift
  - Moving a load a significant distance

- All transfer tasks produce excessive compressive forces on spine (Marras et al., 1999)

Solicit assistance

- Additional staff--Back stress only reduced by 10% (Marras et al., 1999)

- Not effective in reducing injuries among health care workers
“No Lift” or “Zero Lift” Policy

Ergonomics Nirvana

OR

Consultant Myopia
“No Lift” or “Zero Lift” Policy

Fundamental Questions

• Can you truly avoid ALL lifting?
• What about pushing, pulling, repositioning, tugging, or holding?
Safe Patient Handling Policy
Rather Than
“No Lift” Policy
The Case Against Lift Teams

Transfers the same risks UNCHANGED from one set of employees to another

- How does this impact sustaining a safe culture?
- What does this say about the “value” of different employees?

Is adding headcount a reasonable long term solution?
What happens with staffing during off-shift and weekends?
Healthcare

Value Adding Activities

Directly promote health and healing of patient

- Clinical procedures
- ADLs
- Patient comfort
- Therapeutic activities
- Therapeutic touch

Non-Value Adding Activities

Consume time, space, resources
Do not directly benefit patient

- Transporting patient
- Transferring patient
- Pulling patient up in bed
- Reaching
- Setting up procedure
- Retrieving supplies
Ergonomics

Fitting the job to the worker

Science

- Study/design of the human-work environment interaction
- Design the work environment according to the capabilities of the human

Objectives

- Improve safety and health
  - Eliminate/reduce risk factors for injury through the design of the work environment
- Increase efficiency, productivity
  - Design optimizes human capabilities and compensates for limitations
- Enhance quality and user satisfaction
PROBLEM IDENTIFICATION AND PRIORITIZATION
Task Analysis:
Additional Information Required

Frequency of Task
Dependency of Patients
Availability of Equipment
Effectiveness of Equipment
Utilization of Equipment
Task Analysis: Interpreting The Data

Which units have the highest dependency patients?
What tasks do these units perform the most frequently?
What equipment do they have available?
How well does that equipment minimize injury risks?
How routinely is the equipment utilized?

Identify the gaps, investigate the cause for these gaps, and determine suggestions for improvement.
Repositioning a Patient

More than 1 to reposition  High Dependency Patients
Weighing a Patient

![Bar chart showing the percentage of daily weight and high dependency patients across different wards and areas.]

- **Percent**
  - 0 10 20 30 40 50 60 70 80 90 100

- **Categories**:
  - 2 West ICU/CCU
  - 3 West
  - 3 South
  - 4 South ICU
  - 4 West
  - 5 South
  - 5 West
  - Ambulatory Care

- **Legend**:
  - **Daily Weight**
  - **High Dependency Patients**

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Chair Orders

- 2 West ICU/CCU
- 3 West
- 3 South
- 4 South ICU
- 4 West
- 5 South
- 5 West
- Ambulatory Care

Chair Orders
High Dependency Patients
IMPLEMENTING WORKPLACE IMPROVEMENTS
**Ergonomics** – Adjusting the environment to accommodate the limitations of human anatomy and physiology

The environment that the patient resides in is the Bed.
Beds can reduce the:

- **Frequency of lateral transfers**,  
  - Powered drive can replace the need for bed to stretcher transfers
- **Frequency and force of repositioning the patient**,  
  - Pivot design and retractable foot reduce sliding down in bed  
  - Top side rail design reduces need to reposition upon entering bed  
  - Mattress material and max-inflate reduce the force to reposition patients
- **Force to maneuver and push a bed**,  
  - Using handles attached to outer edges of frames instead of using headboards provides better leverage for turning/maneuvering the bed  
  - Short wheelbase provides enhanced maneuverability  
  - Powered drive further reduces forces for pushing and maneuvering
- **Frequency and force of transferring a dependent patient to a chair**,  
  - Full chair position can replace the bed to chair transfer
Beds can reduce the:

• Force to turn a patient in bed,
  • Turn assist feature can reduce the force to turn a patient
• **Frequency and force to weigh a patient**
  • Integrated scales can replace the need to move patient from bed to scale
• **Force of assisting a patient exit and enter the bed, and**
  • Chair egress reduces the force of assisting a patient to and from bed
  • Siderail design provides leverage locations for the patient to assist more during either chair or side egress from the bed
• **Frequency of transferring the patient to a specialty surface.**
  • Integrated treatment surface can reduce the need to transfer to specialty surfaces
  • Bed modules provide Treatment on Demand, moving modules between beds rather than patients
Building in Ergonomics

Easier Entrance/Exit to Bed

One Button Up-In-Chair Placement

Assisted Patient Turning

Powered Drive on Bed
Building in Ergonomics

Foot board retraction
Risk Factors: Environment

• Bathroom/shower door design

• Avoid open door as an obstacle either inside or outside the bathroom or shower stall

• Width of bathroom and shower entrance should allow for the patient, caregiver and assist devices.

• Ideally, the door width should be 48”.

• Entrance to shower should be flush with bathroom floor to allow ease of use for assist equipment and to avoid presenting an obstacle for patients and caregivers
Risk Factors: Environment

• Reduce/eliminate hallway and room clutter where possible. Difficult to maneuver equipment with patients in crowded areas.
Risk Factors: Environment

• Ramps and floor surfaces
Risk Factors: Environment

- Equipment that doesn’t fit people using it
- Equipment isn’t adequately maintained
- Equipment doesn’t match task demands
Suggested Solutions: Patient Handling Equipment

- High visibility placement and ease of accessibility of lifting equipment will promote consistent use.
- Do not block access.

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It takes more than the “right product” or “good environment” to achieve lasting success.

Product  System Solution  Program
Ergonomics Improvement Process

Root Cause Analysis
• Risk Assessment Tools and Training
• Historical Cause Analysis
• Financial Impact Analysis
• Detailed Ergonomics Assessments

Identify Solutions
• Safety/Ergo Team Training
• Facility Design Review/Recommendations
• Detailed Ergonomics Assessments

Sample Policies
• Facilitate Policy Development Workshop
• Program Review Services

Develop Policy & Procedure

Implement Solutions
• Ergonomics Awareness Train-the-Trainer
• Management Overview Courses
• Safety and Ergonomics Team Training

Educate Staff
Ergonomics Improvement Process

- Root Cause Analysis
- Identify Solutions
- Develop Policy & Procedure
- Implement Solutions
- Educate Staff
- Internalize Ergonomics Management Skills
Musculoskeletal Injury Reduction

Product
- Beds
- Lifts
- Furniture
- Etc.

System Solution

Program
- Lifting Policy Development
- Establish Ergonomics Team
- Awareness Training Programs

Ergonomic Awareness Training That Incorporates Specific Product Features

Policies and Procedures That Coincide With Product Capabilities

On-going Program Review and Improvement
Lifting Policies are Cited as a Critical Component for Reducing Caregiver Injuries

And more frequently: The lack of a clear program or enforcement of that program is cited as the reason for poor effectiveness with injury reductions efforts
Making a Plan Work

What works?
• Clear discipline policies
• Manager/Supervisor accountability
• Employee involvement in policy development
• Reinforcement of desired behaviors
Manager Accountability

Insufficient in most organizations, rare in health care

You can’t change what you don’t measure

Organization behavior will match organization reward structures, not vision and policy statements
Future?