Best Practices for Reducing Patient Lifting Injuries

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Disclaimers

• Marie Martin does not speak for the Dallas VA.
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Patient Care is High Risk

“When lying in a bed, a patient is placed inconveniently for lifting, and the weight and placing of such a load would be tolerated by few industrial workers.”

Lancet 1965
Patient Care is High Risk

Back pain and musculoskeletal injury are common among health care workers.

- 52% of nurses complain of lower back pain (LBP). (Nelson, 2003)
- 12% of nurses leave the profession every year because of LBP. (Stubbs et al, 2006)
- 20% of nurses transfer to another unit because of LBP (Owen, 1989)
- 38% have back pain severe enough to have lost time (Owen, 2000)
- Many musculoskeletal injuries are not reported (OHSAAH, BC, 2006)

Stories at WINGUSA.org

Costs of Caregiver Injury

- Direct cost of medical care
- Direct cost of lost time
- Long-term disability cost
- Overtime for work not done
- Errors from understaffing or fatigue
- More work for those not on light duty
- Recruiting replacements
- Loss of experience and expertise from bedside
Why are Patient Care Providers at High Risk?

For Nurses, causes of these injuries and disorders are:

– **Overexertion** due to lifting of excessive loads
– **Cumulative** effects of repeated patient handling tasks

(Smedley, Egger, Cooper, & Coggon, 1995; Marras, 1999, OSHA 2003)
Lower Back Surgery

• “No operation in any field of surgery leaves in its wake more human wreckage than surgery on the lumbar discs” (DePalma and Rothman, 1970)
• Surgical success rates for discectomy: 42.6% vs. 32.4% non-operative (Weinstein et al, 2006)
• Treatment cost has increased 65% in 8 years after adjusting for inflation (Martin et al, 2008)

Prevent back injuries: They can be permanent.
Intervertebral Disc

- The primary source of low back pain is suspected to be the disc (Nachemson, 1976; Videman and Battie, 1996; An, 2004)
- Noxious stimulation of the disc produces symptoms of low back pain
- Annular tears and reduced disc height are associated with low back pain (Videman et. al., 2003)
- Mechanical load can be the stimulus for pain (Marras, 2000)
How Cumulative Trauma Develops in the Spine

Vertebral Endplate
Disc Nutrition through Diffusion

Vertebral Body
Vertebral End Plate
Disc
How Cumulative Trauma Develops in the Spine

Vertebral Endplate

Microfractures
How Cumulative Trauma Develops in the Spine

Vertebral Endplate

Scar Tissue Development
Diffusion Interruption
Stages of Disc Degeneration

A

B

C

D
How Different Positions Affect Spinal Pressure

Relative changes in pressure/load in the 3rd lumbar disc in various positions in living subjects

- Lying: 25
- Sitting: 80, 100
- Standing: 150, 170, 220, 250, 400
Spinal Loading & Stress

• Patient handling tasks are often tasks with loads (patient body/limbs) held away from the body

• To minimize risk of injury, keep load as close as possible to your body’s center of mass
There is no way to manually lift a patient safely, even with 2 people.

• Forces measured during transfer and repositioning on normal size patients

• 1 and 2 person methods for lifting and repositioning compared

• Forces always exceeded safe limits

• Forces approached or exceeded maximum tolerances for 1-person tasks or repositioning without sheets

Marras 1999
L5/S1 disk compression on a 50th percentile caregiver manually transferring a patient from chair to bed.

- 141 lb. Patient: 1551 lbs.
- 244 lb. Patient: 1847 lbs.

Graph showing disk compression in lbs. for manual transfer of 141 lb. and 244 lb. patients, compared to NIOSH Upper Limit and Design Limit.
How much human weight can we lift safely?

• NIOSH equation does not apply to people: unpredictable assistance, slips, falls
• For patients: 35 pounds in good position with compliant patient. (Waters, 2007)
• Less in awkward positions or on long shifts.
• 22 lbs. at arms’ length (Snook, 1991; AORN 2007)
• A falling patient may exert higher forces.
What does 35 pounds mean?

• 35 lbs. = 1 leg of a 200-pound man.

• Draw sheet transfer/repositioning requires force equal to 72.6% of a patient’s weight. (Lloyd and Baptiste, 2006)

• Log rolling a compliant, dependent patient requires force equal to 32% of patient weight. (Gonzalez et al, 2009)

• Pulling small patients up from the head of the bed has resulted in paralysis.
Fact or Myth?

“Staff in great physical condition are less likely to be injured”.

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Myth!

“Staff in great physical condition are less likely to be injured”.

The literature shows this is not true. Why?

• More exposure
• Co-workers are 4X more likely to ask them for help.
Fact or Myth?

“If you buy patient handling equipment, staff will use it”
Myth.

“If you buy it, staff will use it”

Reasons staff do not use equipment: time, availability, difficulty, space constraints, and patient preferences.
Fact or Myth?

“Various lifting devices are equally effective”.
Myth.

“Various lifting devices are equally effective”.

Some lifting devices are as stressful as manual lifting. Equipment needs to be evaluated for ergonomics as well as user acceptance.
Fact or Myth?

“Classes in body mechanics and lifting techniques are effective in reducing injuries”.

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Myth.

“Classes in body mechanics and lifting techniques are effective in reducing injuries”.

35+ years of experience shows training alone is not effective.
Training vs. Changing the Work

• Body mechanics training alone is ineffective
  – 12 studies over 25 years
  – Forces exceed biomechanical capacity

• Ergonomic approaches reduced injuries by 20-80%
  – 15 studies over 14 years
  – Equipment, training, and systems
Fact or Myth?

“If you institute a No-Lift Policy caregivers will stop lifting”.
Myth.

“If you institute a No-Lift Policy caregivers will stop lifting”.

Before Minimal Lift Policies are implemented, infrastructure needs to be in place...

Technology & Support Structures.
Fact or Myth?

“We don’t have time to use the machines. The old way is just as good for the patients.”
Myth.

“We don’t have time. The old way is just as good for patients.”

• Safer patient handling methods can prevent pain, falls and skin damage.
• Safer patient handling methods can provide better mobility and allow faster healing.
• Time is saved when fewer caregivers are required. Equipment is often just as fast.
Pressure Ulcer Results at Northern MI Regional Hospital

Average Incidence of Hospital Acquired Pressure Ulcers per Quarter (per 1000 patient days)

Year Two: 88% Reduction
What interventions work?

- Unit Ergonomic Evaluations with staff input
- Facility Coordinator for Safe Patient Handling, with committee and/or liaisons.
- Unit Peer Leaders: coaches, advocates, problem solvers
- Assessment and communication of patient abilities and safe handling methods
- Patient handling equipment evaluated by staff
- Program support from top leadership
How do you move a patient safely?

- **Algorithms** developed with input from VA, NIOSH, ANA, APTA, and nursing organizations:
  - General (6 tasks)
  - Bariatric (8 tasks; in revision)
  - Orthopaedic (4 tasks and 2 limb/cast weight tools)
  - OR (5 tools and 2 tables)

- **Scoring system** developed at Bay Pines VA:
  - Simpler evaluation, 0-4 scale
  - Incorporates uncertainty
Safe Patient Handling- Patient Mobility Tool

If your patient cannot do any or all of the following:
A.) Sit upright on the side of bed  B.) Sit or lean forward in a chair without assistance or  C.) Understand and follow instructions appropriately and cooperatively then use a mechanical or overhead lift and place a repositioning sheet on the bed.

*If your patient is at high risk for falls consider using safe patient handling equipment/aids for related patient handling tasks.

Anytime you anticipate lifting greater that 35lbs use lift equipment/aids.

☐ INDEPENDENT
- Cooperative and cognitive
- Able to bear full weight
- Consistent reliable in balance
- Mobilizes independently without assistance

☐ SUPERVISED PARTIAL ASSIST
- Able to bear full weight
- Consistent reliable balance
- May need verbal cues to use mobility assist devices.

☐ MINIMAL PARTIAL ASSIST
- Able to bear most (> 75%) of own weight
- Has ability to balance
- Understands and cooperates
- Good bilateral upper body strength
- Can maintain a seated position

☐ MODERATE PARTIAL ASSIST
- Follows simple commands, cooperative
- Able to bear some (> 25%) of own weight
- Has some upper body strength
- Sits up well with assist

☐ MAXIMUM/DEPENDENT ASSIST
- Unable to assist in most (0-25%) of own mobility
- Unable to bear weight
- Unable to follow directions

1 person observation and/or assist:
- Walker/cane/crutches
- Glide board for seated transfers
- RollOn (non-motorized stand aid)

1 or 2 person assist with use of:
- RollOn (non-motorized stand aid)
- Carredo Shower Chair (CLC)
- Glide board for seated transfers
- Gait belt/walker

Minimum 2 people assist with use of:
- Sabina or EZ Way (motorized stand assist)
- Carredo shower Chair (CLC)
- Glide board for seated transfers
- Rollbord/air slide (lateral transfers)
- Golvo (multipurpose lift) and/or ceiling lift
- Bed assist features
- Green Repositioning Sheet

Minimum 2 people assist with use of:
- Golvo or ceiling lift
- Roll board/air pal (for lateral transfers)
- Bed assist features, repositioning sheet
- No Ambulation on own
- Green Repositioning Sheet
Description of Levels of Assistance Needed

- Level 4 is a totally dependent patient – Heavy Assist
- Level 3 is a patient who needs a moderate amount of help.
- Level 2 is a patient who needs a minimal amount of help – staff lift <35 pounds
- Level 1 needs very little help but may need very cues, light touch, or and/or cueing.
- Level 0 is independent, observation only needed, standby for safety
Ceiling Lifts
SPH Technology: Floor and Car Lifts
SPH Technology: Sit to Stand Lifts

- Active (raise the patient electrically)
- Passive (no electricity – patient must pull up)
- Requires some help from patient
SPH Technology: Slings

• Check before using:
  – Compatibility/attachment
  – Sling type/shape
  – Size (aim small)
  – Clean and intact
SPH Technology: Lateral Transfer/Repositioning

- Air-assisted transfer mats lower friction by 85-90%
- Foam-center Roll boards
- Slide sheets
- Slide boards
- One way slides for fall prevention
SPH Technology: Air-Powered Lifting

- Raise heavy loads from floor without slings, allow transfer onto stretcher
- Evacuation version allows sliding down stairs
SPH Technology: Powered Transport

• Powered stretchers or beds
• Powered wheelchair movers
• More sought to handle slopes and heavy patients
Bathing/Toileting

• Ergonomic shower/commode equipment
  – Shower trolleys that assist in turning
  – Ergonomic hygiene chairs
  – Lifting toilet seats
  – Bariatric equipment needed
Not all equipment works equally.

- Floor lifts require more force, especially with carpet, small wheels, obstructions or tight spaces. (Marras 2008)
- Some lateral transfer devices work better for patients and staff. (Lloyd and Baptiste 2006)
- Manual transfer aids may not reduce the forces.
- Make sure front-line patient caregivers have a strong say in evaluation!
Keys or Killers for SPH Programs

• Systems and Support
  – Availability and appropriateness of equipment
  – Supply of clean slings of appropriate type and size
  – Information flow between services and shifts
  – Adequate staff to handle patient load and all tasks/demands
  – Funding for equipment, staff and training with expected ROI
  – Peer leaders as coaches, with time and support
Keys or Killers for SPH Programs

• Culture
  – Individual decisions: Clinical judgment
  – Consequence of reporting an incident or near miss: blame or learning and solution?
  – Management training, expectations and priorities
  – What is measured?
  – What is rewarded?
  – What do people do when they don’t have what they need?
Change Management

• Support systems and funding
• Environment (design, equipment, time)
• Policy and procedures
• Training at many levels
• Individual attitude and behavior (WIIFM?)
• Continuing conversations with units
• Linking to values of individual and organization
Drivers of Ergonomic Efforts

• Cost of Injuries

• Staffing, Logistics, and Career Development
  – Loss of skilled staff
  – Light duty and absent employees
  – Excess load on those still working
  – Forced changes of career
  – Recruiting advantages
Drivers of Ergonomic Efforts

• Outside Oversight
  – Joint Commission and other accreditations
  – OSHA guidelines and resources
  – Laws in Texas and 7 other states
Lessons Learned
Lessons Learned

• This program requires constant maintenance.
  – People forget things they learn and don’t use immediately and regularly.
  – Old habits die hard. Gloves took time too.
  – Planning needs to include SPH.
  – System changes require major training and intervention in large organizations.
  – Advocates need to feel supported and appreciated.
Lessons Learned

• Unit Peer Leaders (UPL) are essential on every shift in every area.
  – Coaching is more effective than annual training.
  – Local advocates can make sure supplies are available and equipment is working.
  – Front line staff who are involved can tell you what works and what doesn’t.
  – Units/shifts with active Unit Peer Leaders use their equipment more and tend to have fewer injuries.
Lessons Learned

• What workers choose, they will use.
  – The front line nurse knows what the manager does not know.
  – One size may not fit all.
  – Trials take longer but get better results.
  – Quirks never show up in bid materials.
  – Front line nursing and PT/OT should be involved in space design to avoid designing in new problems.
Lessons Learned

• Innovation and testing are both necessary.
  – Caregivers need to know their alternatives when their usual equipment breaks or is unavailable.
  – Caregivers find new ways to use equipment – sometimes off label.
  – When anything goes wrong, the official instructions are paramount.
  – Anyone untrained on any piece of equipment is a potential hazard.
Lessons Learned

• Safety and patient centered care need not be adversaries.
  – Improvements in dignity, pain, skin care, mobility, and autonomy
  – Care for fallen patients
  – Home-like environment
  – Mental health solutions
  – Home care solutions
Lessons Learned

• Networks help immensely.
  – Unit Peer Leader meetings and training sessions
  – VA Facility Champion network
  – Safe Patient Handling Conferences
  – ANA, AORN, etc.
Problems and Solutions
Example 1: Pull up in Geri-Chair

Risk Factors:
- Back – posture, load/force
- Shoulder – load/force
- Elbow – load/force
- Wrist/hand – load/force
- Neck – load/force

Interventions:
- Sit to Stand Lifts
- Full Body Sling Lifts
- Friction Reducing Devices
Example 2: Transfer to Stretcher

Risk Factors:
- Back – posture, load/force
- Shoulder – load/force
- Elbow – load/force
- Wrist/hand – load/force
- Neck – load/force

Interventions:
- Full Body Sling Lifts
- Lateral Transfer Devices (LTD)
  - Friction reducing devices
  - Air Assisted LTD
  - Mechanical LTD
Example 3: Transfer from Chair for partial weight-bearing patient

**Risk Factors:**
- Back – posture, load/force
- Neck – load/force
- Shoulder – load/force
- Elbow – load/force
- Wrist/hand – load/force

**Intervention:**
- Sit to Stand Lift
Final Thoughts

Figure 2. Patient Handling Injury Incidence Rates for Nursing Occupations, All Facilities (N=139)

- Incidence Rate per 10,000 FTE
- Fiscal Year: FY04, FY05, FY06, FY07, FY08, FY09, FY10, FY11

- FY04: 4th Annual SPH Conference
- FY06: National SPH Consultant Site Visits, Implementation at some facilities.
- FY08: National VHA Implementation
- FY10: 10th Annual SPH Conference

Cope et al, 2012
Final thoughts:

• Equipment alone will not fix the problem.
• Training alone will not fix the problem.
• One person alone will not fix the problem.
• Safety culture affects everything else.
• We learn from each other and keep getting better.
• Taking care of our caregivers results in taking care of our patients.
Resources

- VA VISN 8 Patient Safety Center: Safe Patient Handling
- AORN Safe Patient Handling Tool Kit
- OSHA Safe Patient Handling page
- NIOSH Safe Patient Handling Training for Schools of Nursing

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