
Giving Care/Taking Care

The Case for Ergonomics in Healthcare

Susan Blitz, MD MPH
University of Michigan Health System
Employee Health Service
June 29, 2006

Table 1: Risk factors for nodding off at lectures

Factor	Odds ratio (and 95% CI)
Environmental	
Dim lighting	1.6 (0.8–2.5)
Warm room temperature	1.4 (0.9–1.6)
Comfortable seating	1.0 (0.7–1.3)
Audiovisual	
Poor slides	1.8 (1.3–2.0)
Failure to speak into microphone	1.7 (1.3–2.1)
Circadian	
Early morning	1.3 (0.9–1.8)
Post prandial	1.7 (0.9–2.3)
Speaker-related	
Monotonous tone	6.8 (5.4–8.0)
Tweed jacket	2.1 (1.7–3.0)
Losing place in lecture	2.0 (1.5–2.6)

Note: CI = confidence interval.

Why Ergonomics in Healthcare?

- “Industrial microcosm” – varied and complex hazards
 - Difficult to control environment
 - Stressful environment
 - Significant injury rate
 - Shortage of workers
 - Aging workforce, particularly nursing
-

Why Ergonomics in Healthcare?

- Culture of giving
 - 24/7 services; long and varied shifts
 - Patient safety concerns; worker safety affects patient safety
 - Regulatory environment (State & Federal)
-

Ergonomic Opportunities in HC

- **Clinical care;** forceful exertions, posture stresses, repetition
 - **Laboratory;** posture stresses (awkward and static), repetition, forceful exertions (pinch grip)
 - **Laundry;** forceful exertions, posture stresses, repetition, extreme temperatures
 - **Environmental Services;** all of the above, contact stresses, vibration
-

Ergonomic Opportunities in HC

- **Sterile Processing;** repetition, extreme temperatures, forceful exertions
 - **Clerical Processes;** repetition, posture stresses
 - **Warehouse Operations;** forceful exertions, awkward postures
 - **Food Service;** repetition, forceful exertions, posture stresses
 - **Pharmacy;** repetition, posture stresses
-

Ergonomic Opportunities

- **Elimination** - Do we need to do it?
 - **Substitution** - Can we do something else?
 - **Engineering** - Can we do it differently?
 - **Administrative** - Can we limit the frequency?
-

Giving Care: and lots of it!

- Practitioners and Technical-6,173,760; Healthcare Support-3,208,770 (2002)
 - Health services employment growth twice as fast as overall economy from 2002-2012
 - Nine of the ten fastest growing occupations are in health or computer fields
 - Registered nurses-largest projected job growth 2002-2012 (increase of 623,000 or 27%)
-

Giving Care: and lots of it!

- Aging baby boomers will require care
 - Increase in life expectancy, increase in chronic diseases and obesity epidemic affect caregivers and patients
 - Patients in hospitals are more acutely ill
 - Stays are shorter; technology greater
 - Despite growth, nursing workforce will fall 20% below requirements by 2020
-

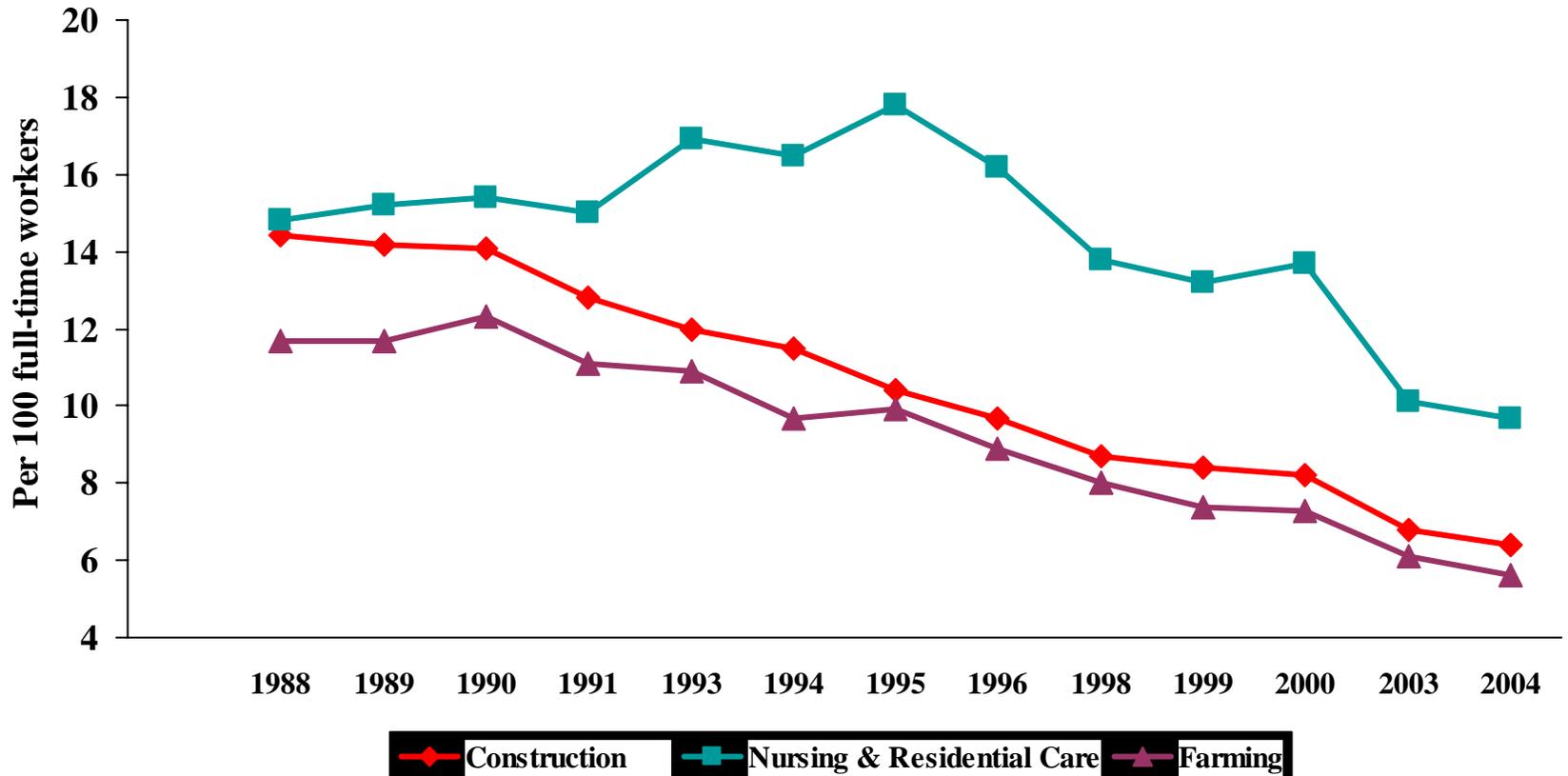
Giving Care: to Boomers, by Boomers

- Labor force is aging; growth greatest in the 55+ sector (49% growth/ 19% of workforce in 2012)
 - Median age increasing from 36.6 in 1992 to 41.4 in 2012
 - Women in labor force will grow faster than men
 - Labor force will become more diverse in future
-

Giving Care: to Boomers, by Boomers

- Nursing workforce is older and aging more rapidly than the US workforce as a whole
 - Fewer younger women choosing nursing, nurses staying in profession longer, aging baby boomer cohort, entering profession at older age
 - Average RN age: 1983- **37**; 2000- **45**
 - By 2010, more than 40% of RN workforce will be **50+** years of age
-

Taking Care: OSHA Recordable Cases



Occupations with most I&I with days away from work

- Laborers and freight stock and material movers
- Truck drivers
- Nursing aides, orderlies, attendants
- Construction laborers
- Truck drivers
- Janitors and cleaners

Recordable Cases per 100 FTE

■ Private Industry	■ 4.8
■ Services	■ 4.6
■ Health Services	■ 6.2
■ Hospitals	■ 8.3
■ Construction	■ 6.4
■ Manufacturing	■ 6.6

Back injuries with LWD/10,000 FTE

■ Nursing homes	181.6
■ Hospitals	90.1
■ Truck drivers	98.4
■ Construction workers	70.0
■ Miners	56.3
■ Agricultural workers	47.1

■ BLS 2000

Cases/100 FTE: Hospitals

<u>Year</u>	<u>Rate</u>
1998	8.4
1999	8.5
2000	8.3
2001	8.2
2002	8.9
2004	8.3

Cases/100 FTE: Nursing Facilities

<u>Year</u>	<u>Rate</u>
1998	13.8
1999	13.2
2000	13.7
2001	13.0
2002	12.1
2004	9.2

(Private Industry 2002: 5.3)

Repetitive Trauma Case /10,000 FTE

■ Meat Packing	48.5
■ Hospitals	26.3
■ Grocery Stores	24.4
■ MD offices & Clinics	20.5

- 2000 BLS data

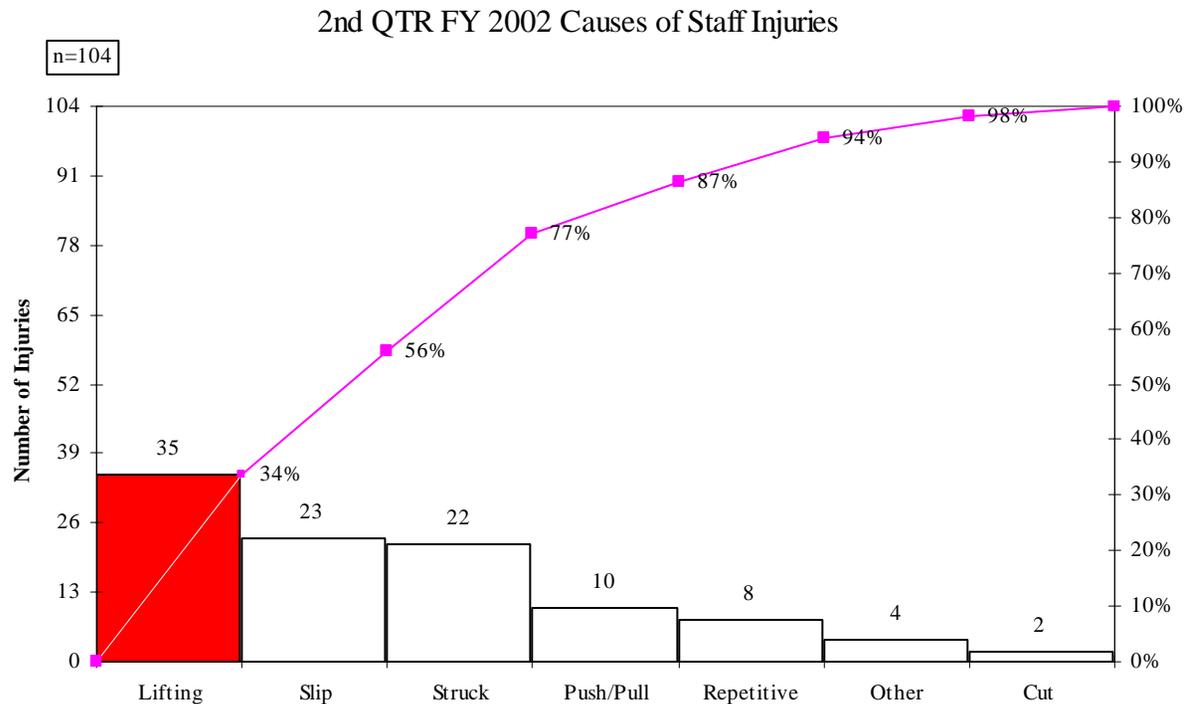


Absence from Work/Lost Worktime Rate

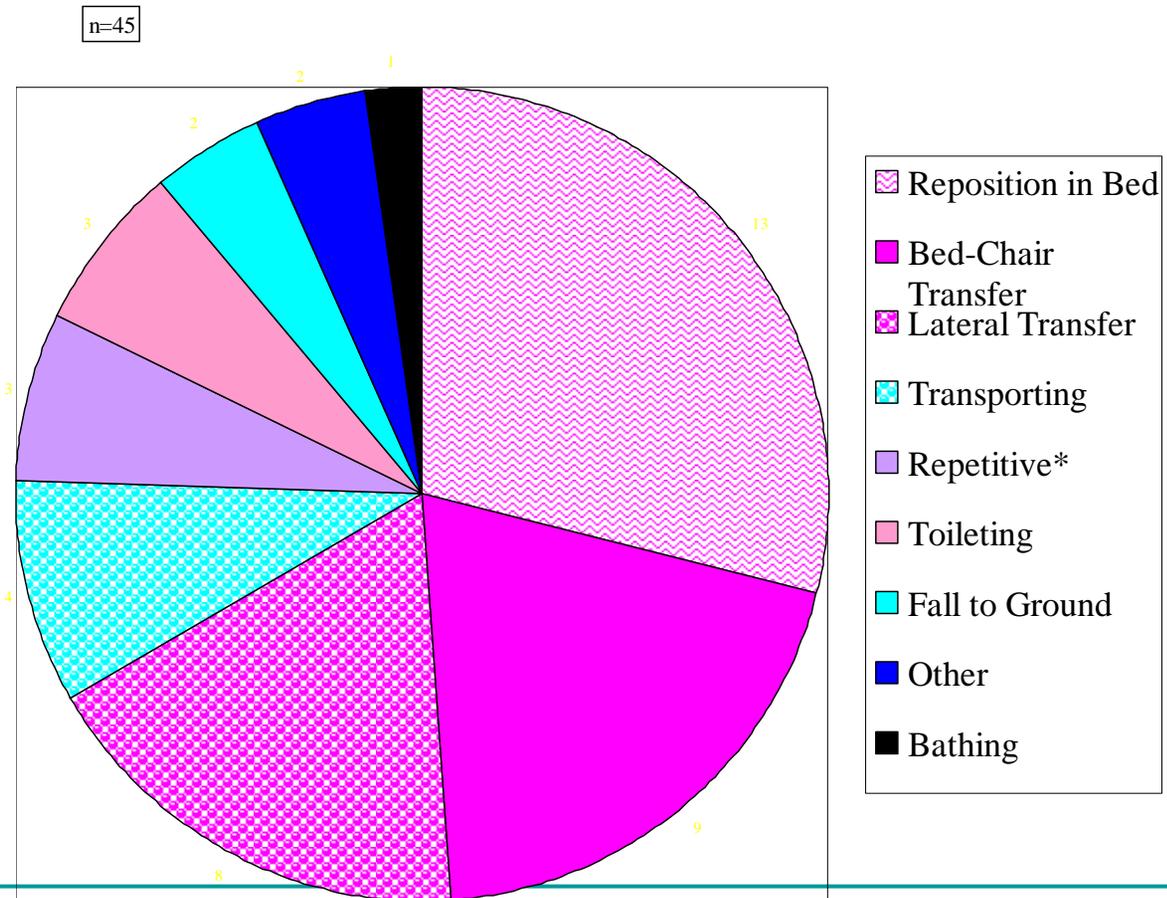
■ Agricultural	2.0	1.2
■ Construction	2.7	1.4
■ Prof. & Bus Services	2.9	1.5
■ Leisure & Hospitality	2.9	1.5
■ Manufacturing	3.1	1.8
■ Private Sector	3.1	1.7
■ Healthcare	4.2	1.8
■ Public Sector	4.4	2.3

■ 2005 household survey data-BLS

Injuries at a Large Hospital in Midwest



Patient Handling Injuries by Activity



The myth of “good body mechanics”

- Manual transfer of a 130 lb. moderately dependent person can exceed the NIOSH RWL
 - Patients don't come with “handles”
 - Lifting may be hazardous but not all hazards are lifts
 - Hospitalized patients can be uncooperative, combative, unsteady or overestimate their strength
 - Layout of hospital room and therapeutic equipment may prevent proper technique
-

“No lift” Program Myths

- Patients don't like mechanical lifts
 - It takes more time to use a lift
 - It's too expensive to buy equipment
 - It's too difficult to decide which lift to use
-

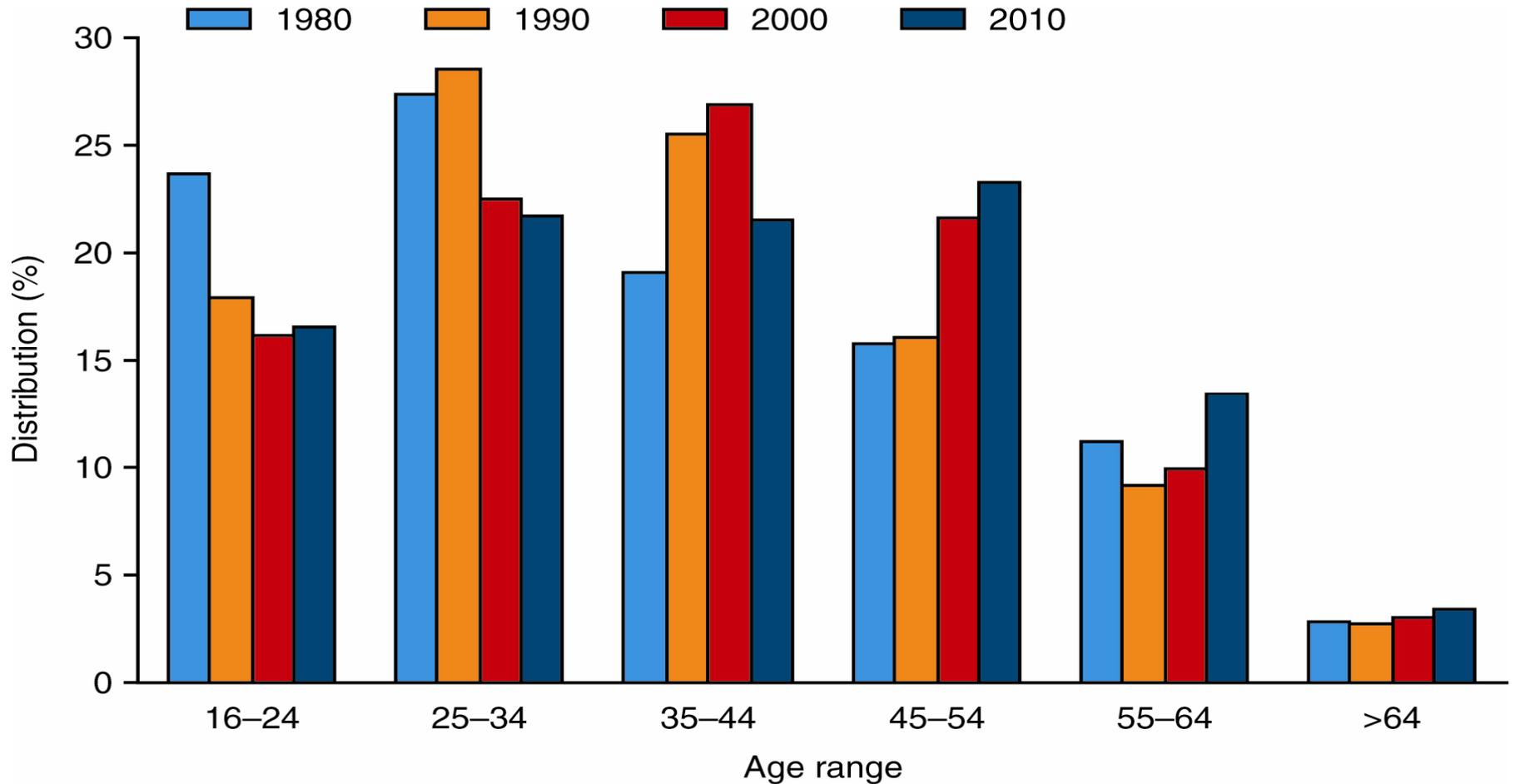
Penny Wise/Dollar Foolish

- Cost of an injury includes indirect costs: replacement costs, overtime, loss of unit morale, decrease in overall health of the injured worker
 - Studies have demonstrated decrease in injury costs with “no lift” program ranging from 58%-99%.
-

Ergonomic Challenges in Healthcare

- Aging workforce
 - Shiftwork
 - Work organization and culture
 - Obesity
 - Regulatory environment
-

Graying of America



© 2003 ~~Deerfoot Daily News~~
HUMOR FEATURES
grimmy.com
MIKE PETERS

I'M GOING TO
CANADA FOR THE
CHEAP DRUGS.



THEN



NOW

Ergonomic Challenges: Aging

Percent Reporting Poor Or Fair Health

<u>Age</u>	<u>Percentage</u>
18-44	5.6
45-64	14.9
65-74	22.5
75+	29.2

2003 data; CDC-NIS

Aging: “Able” vs “Stable” bodied workers

- Sensory - visual and auditory
 - Musculoskeletal-strength, endurance, flexibility, balance
 - Cognitive changes – decreased memory, reaction time, ability to multi-task
 - Circadian rhythm changes-nap more, awaken earlier
-

Conditions Associated with Aging

- Osteoarthritis- decreased flexibility, range of motion
 - Cardiovascular disease-decreased endurance, strength
 - Diabetes-changes in vision, balance
 - Depression-affects sleep and cognition
 - Osteoporosis-decreased height, risk with falls
 - Polypharmacy-adverse effects of drugs
-

Workplace Challenges of Aging

- Decreased height, decreased reach
 - Computer workstation and lab design
 - Machinery and assistive devices design
 - Cognitive Changes-decreased reaction time, memory, decreased multi-tasking
 - monitor displays
 - task organization
 - noise in hospitals
-

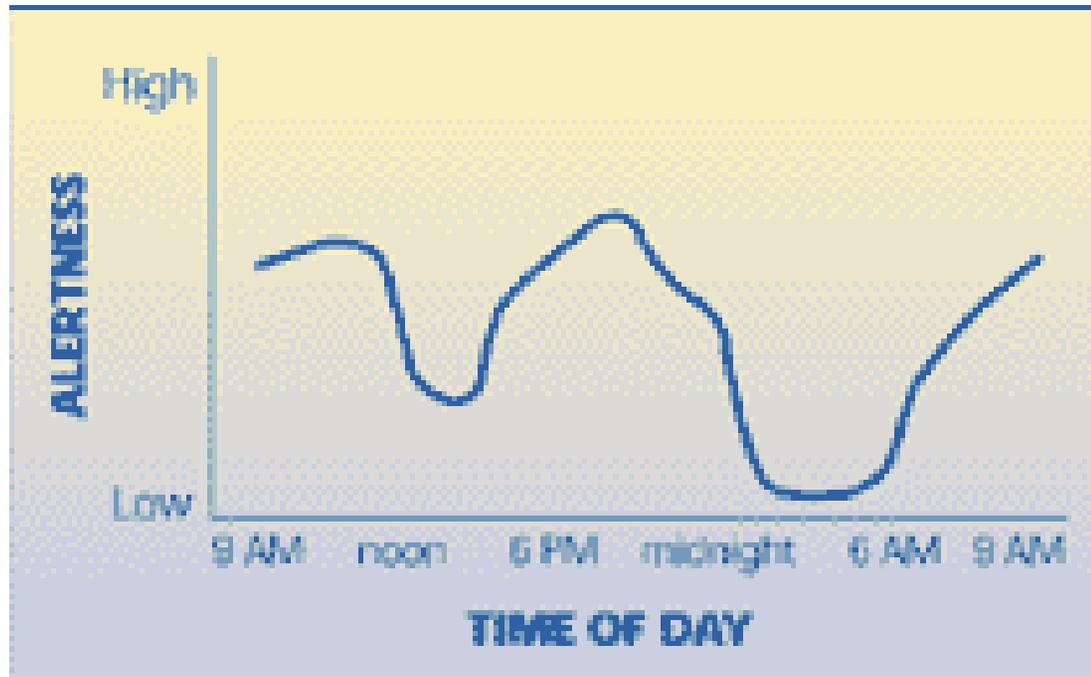
Workplace Challenges of Aging

- Decreased auditory and visual capacity
 - Adjustable monitors
 - Point of care lab tests
 - Staff and patient communication
 - Urinary system changes
 - Implications for restroom placement and breaks
-

Ergonomic Challenges - Shiftwork

- Increased patient acuity, shorter stays and shortage of personnel = longer hours, fewer breaks, less recovery time
 - Work-life conflicts may increase demand for longer shifts
 - Discrepancy between “scheduled” and “actual” shifts
 - Balance shift length and continuity of care
-

Ergonomic Challenges – Shiftwork



Ergonomic Challenges - Shiftwork

- Night shift workers sleep fewer hours than day shift
 - Work duration, overtime and hours worked per week affect likelihood of errors
 - Performance of older workers may be decreased across 12 hour shift
 - Older workers may be affected more by disturbance of circadian rhythm
-

Ergonomic Solutions- Shiftwork

- Napping before shift or during shift may help
 - Carpools/taxis for night shift workers
 - Bright lights may enhance alertness
 - Lengthen shift change intervals; forward shifts
 - Educate workers to attend to signs of decreased alertness
 - Medications may be useful in future
-

Ergonomic Challenges-Culture

- Inappropriate perception of risks or lack of acknowledgement
 - Culture of giving-conflict between patient and worker safety
 - Engineering controls less than in other industries of comparable risks
 - Worker involvement in safety lags behind other industries
-

Ergonomic Challenges-Culture

- Feel relatively powerless to change their environment
 - Feel that image of nursing is poor because of poor work environment
 - 75% responded that unsafe working conditions interfere with ability to deliver quality care
 - ANA survey
-

Ergonomic Challenges-Culture

- 88% of nurses reported that health and safety concerns influence decision to stay in nursing
 - Disabling back injury was one of the primary health and safety concerns
 - 12% of nurses “leaving for good” because of back pain
-

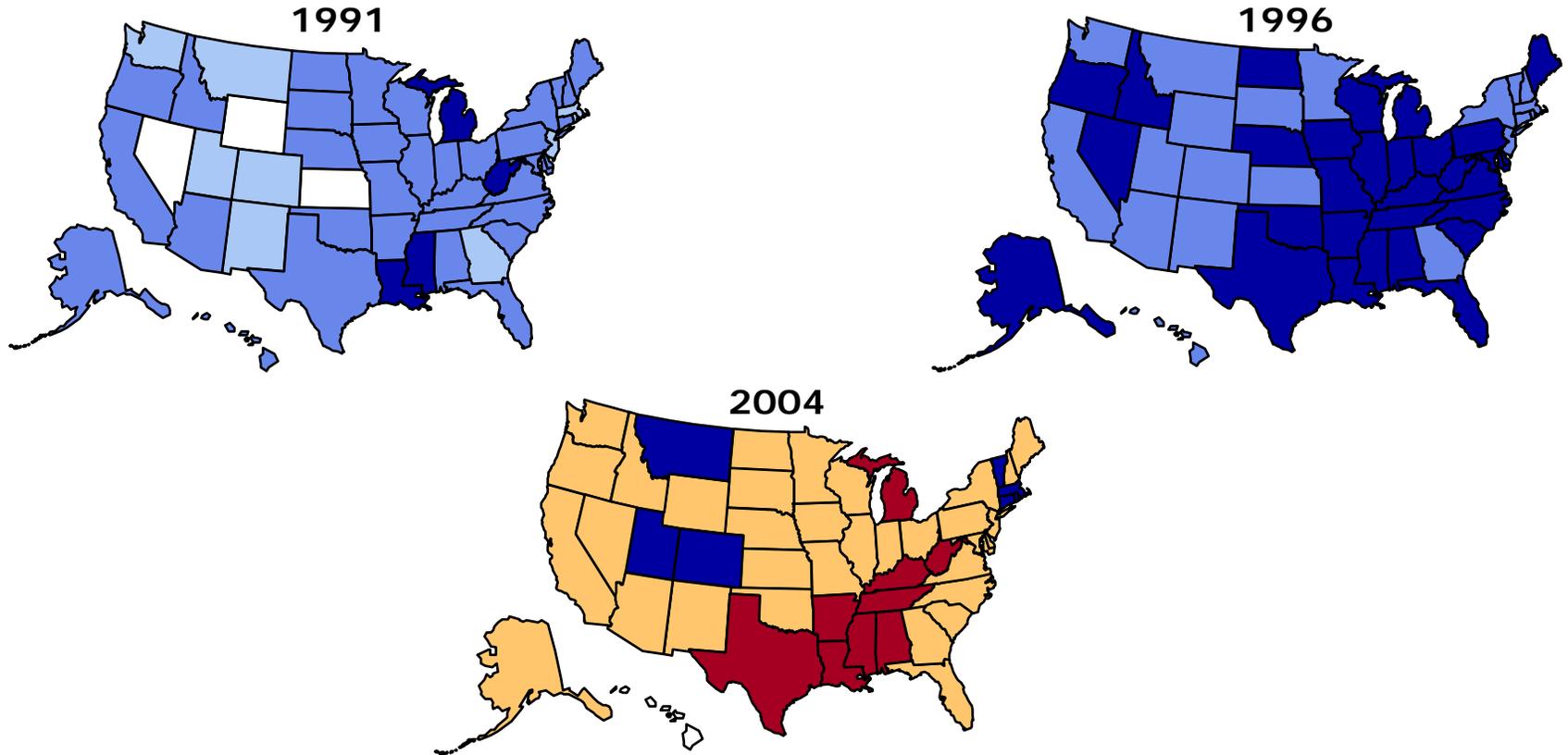
Changing the Culture

- Empower employees to control their environment
 - Promote a culture of safety
 - Clear objectives
 - Fair, confidential reporting system
 - Analyze incidents and provide feedback
 - Incentives and rewards for proper behavior
 - Leadership commitment
-

Obesity Trends* Among U.S. Adults

BRFSS, 1991, 1996, 2004

(*BMI ≥ 30 , or about 30 lbs overweight for 5'4" person)



Ergonomic Challenges - Obesity

- Increase in worker obesity
 - Increase in patient obesity
 - Increase in bariatric surgery
-

Ergonomic Challenges-Regulatory Environment

- OSHA special emphasis program for nursing and personal care facilities (2002-2004)
 - OSHA ergonomic guidelines for nursing facilities (2003)
 - OSHA regional special emphasis program for hospitals (2003)
 - State legislative efforts-Texas, WA (California)
 - JCAHO EC standards EC.1, EC.10, EC.11
-

Other Challenges

- Turnover
 - Contingent workers
 - Space constraints
 - Rapid changes in technology
 - Lack of standardization of tasks/variability
 - Unique challenges of homecare
 - Finding “light duty work” for injured HCWs
-

“If we don’t succeed, then we will fail”

Dan Quayle

Ergonomic Programs in Healthcare

- Management leadership and support
 - Adequate resources for personnel, equipment and training
 - Involve front line workers
 - Involve ergonomic expertise during new construction or renovation
 - Equipment is essential but not sufficient
-

Ergonomic Programs in HC

- Look at injury statistics for priorities
 - Evaluate equipment marketplace
 - Trial equipment
 - Monitor use of equipment and processes
 - Utilize multiple training opportunities
 - Enlist peers and opinion leaders for training and support
-

“Healthcare workers are already
working harder, smarter and longer;
now we must learn to work
(and live) safer and healthier”

Susan Blitz
