Costs and Benefits of Ergonomics Programs & Interventions**

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Healthcare Ergonomics

Source	Workplace	Interventions	Costs	Measurements	Savings
Ergonomics Task-Force. (2002, July 25). *Ergonomics Task-Force July 25, 2002, meeting.* http://www.doli.state.mn.us/fourthmeetingminutes.html [https://web.archive.org/web/20050830132216/http://www.doli.state.mn.us/fourthmeetingminutes.html]	Ag-Gwah-Ching Nursing Home	Program, employee involvement, management responsibilities, lift equipment, chairs, workstations, training, safety teams		Lost workday injury rate 11.3 down to 4.5, 60% decrease in workers' compensation costs	
Wood, D. (2004). Nurse Safety: Investments in Equipment, Training Help Prevent Back Injuries. Rn.Com. http://w3.rn.com/news_features.asp?articleID=10820 [https://web.archive.org/web/20061019002939/http://w3.rn.com/news_features.asp?articleID=10820]	United Kingdom healthcare	They implemented a "no-lift" policy in 1993. Nurses in the United Kingdom use sling lifts, stand-assist lifts, lateral transfer equipment and other devices to lift patients.		84 percent reduction in lost work hours and a 98 percent drop in absenteeism due to lifting and handling	
Ergonomics Task-Force. (2002, July 25). *Ergonomics Task-Force July 25, 2002, meeting.* http://www.doli.state.mn.us/fourthmeetingminutes.html [https://web.archive.org/web/20050830132216/http://www.doli.state.mn.us/fourthmeetingminutes.html]	Care Providers, nursing homes	Low lift program, with mechanical lift assists (18)		14% reduction in time loss claims, 33% reduction in all claims over 3 years, 73% reduction in time loss costs, 51% reduction in all claims costs	
GAO report, 1997. *WORKER PROTECTION: Private Sector Ergonomics Programs Yield Positive Results.* GAO/HEHS- 97-163 GAO, United States. General Accounting Office. Washington, D.C.	SOCHS Nursing homes 775 workers	Program, hired safety coordinator, staff and employee involvement, ergo task force, purchasing and design, carts, patient lifts, workstations, chairs, laundry bins, smaller laundry bags, mats, training, policies, medical management	$60,000 for 14 lifts	Average cost per WMSD $2,500 up to $3,000 (-20%) in 3 years (due to one time loss claim). Incidence rate 14.7 down to 12.3 (16%). Lost workdays down 35 per 100 FTEs, restricted workdays up 45 per 100 FTEs. Improved efficiency, morale, reduced turnover and absenteeism.	Workers' comp costs $111,000 down to $72,000 in 3 years (35%).
Ohio BWC grant program: https://www.bwc.ohio.gov/downloads/blankpdf/ExtendedCare.pdf	27 Extended care facilities	Floor lifts. Average risk factor score for patient lifting tasks 70 down to 30.5 (56%). (Over avg. 298 day follow up)		The CTD incidence rate 21.3 per 200,000 hours down to 11.9 per 200,000 hours (44%). ROI for the floor lifts is 2.5 months; Days lost 127.2 per 200,000 hours down to 79.0 per 200,000 hours (38%); Restricted days 96.6 per 200,000 hours down to 87.0 per 200,000 hours (10%); Turnover 98.5 per 200,000 hours down to 74.1 per 200,000 hours (25%);	
Ohio BWC grant program: https://www.bwc.ohio.gov/downloads/blankpdf/ExtendedCare.pdf	11 Extended care facilities	Ceiling lifts . Average risk factor score 36 down to 21 (42%). Over avg. 143 days follow up)		Incidence rate and lost days incidence rate increased. Restricted days 81.3 per 200,000 hours down to 77.2 per 200,000 hours (5%); turnover rate 159.7 per 200,000 hours down to 155.2 per 200,000 hours (3%);	
Ohio BWC grant program: https://www.bwc.ohio.gov/downloads/blankpdf/ExtendedCare.pdf	1 extended care facility	Geri-chairs The average risk factor score for patient lifting tasks was 56 before using the geri-chairs and was seven after the chairs were in use — an 87-percent improvement.		Restricted days due to CTDs 7.2 per 200,000 hours down to 0 per 200,000 hours (100%); Payback 1.4 months; Days lost 14.4 per 200,000 hours worked to 0 (100%); Restricted days 35.5 per 200,000 hours down to 0 (100%); turnover 168 per 200,000 hours down to 68.9 (59%).	
Ohio BWC grant program: https://www.bwc.ohio.gov/downloads/blankpdf/ExtendedCare.pdf	8 Extended care facilities	Hi-Lo beds The average risk factor score for patient lifting tasks was 31.6 before using the hi-lo beds and was 21.4 after the beds were in use — a 10-percent improvement.		CTD incidence rate 21.1 CTDs per 200,000 hours down to 15.0 (29%); Payback period 8.5 months; Days lost 72.7 per 200,000 hours down to 20.1 (72%); Restricted days due to CTDs 53.1 per 200,000 hours down to 36.7 (31%); turnover 71.9 per 200,000 hours down to 65.2 (9%);	

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Ohio BWC grant program: https://www.bwc.ohio.gov/downloads/blankpdf/ExtendedCare.pdf	1 extended care facility	Bathing systems The average risk factor score for patient lifting tasks was 31.6 before using the hi-lo beds and was 21.4 after the beds were in use — a 10- percent improvement.		CTD incidence rate 39.3 CTDs per 200,000 hours down to 0 (100%); Payback 0.7 months; Days lost due to CTDs remained at zero; Restricted days due to CTDs 368 per 200,000 hours down to 0 (100%); turnover 185 per 200,000 hours down to 0 (100%);	
Ohio BWC grant program: https://www.bwc.ohio.gov/downloads/blankpdf/ExtendedCare.pdf	69 healthcare facilities	Various equipment		Incidence rate 18.5 per 200,000 hours down to 11.6 per 200,000 hours (37%); days lost 95.8 per 200,000 hours down to 58.8 per 200,000 hours (39%); restricted days 79.5 per 200,000 hours down to 58.8 per 200,000 hours (26%); turnover 96.8 per 200,000 hours down to 80.9 per 200,000 hours (16%). 299 day period.	
Ohio BWC grant program: https://www.bwc.ohio.gov/downloads/blankpdf/ExtendedCare.pdf	Champaign County Nursing Home	32 electric beds. Arjo patient lift	$59,000	16 CTDs per 200,000 hours down to 0 CTDs at 7 months after the intervention. Lost days rate 289 per 200,000 hours down to 0 lost days at seven months after.	
Ohio BWC grant program: https://www.bwc.ohio.gov/downloads/blankpdf/ExtendedCare.pdf	Calvary Manor nursing home	Zero lift system; by purchasing 20 Ultra Care electric beds, an Apollo Bath System and the two lift-n-weigh assists. Patient handling risk factor scores decreased from 35 to 28.	$13,053	In 18 months, CTD incidence rates fell from 22 to 14 incidents per 200,000 hours worked. Restricted-days rate decreased from 121 to 44 days per 200,000 hours worked. Turnover rate went from 55 percent to 32 percent.	
Ohio BWC grant program: https://www.bwc.ohio.gov/downloads/blankpdf/ExtendedCare.pdf	Wood County Nursing Home	Six lifts to assist in the transfer of residents.	$25,347.30	CTD rate fell from 29.6 CTDs per 200,000 hours down to 15.5 CTDs per 200,000 hours one year after the intervention. Turnover decreased from 58 percent before the intervention to 35 percent after.	
https://www.osha.gov/successstories/citizens	Citizens Memorial Healthcare	All jobs evaluated, training, employee involvement, workstation adjustments, lift assist equipment		66 percent decrease in injuries	
Provider – American Health Care Association, February 2001, A Look At No-Manual- Lift Programs, Betty Z. Bogue; Ergonomics Task-Force. (2002, July 25). *Ergonomics Task-Force July 25, 2002, meeting.* http://www.doli.state.mn.us/fourthmeetingminutes.html [https://web.archive.org/web/20050830132216/http://www.doli.state.mn.us/fourthmeetingminutes.html]; Wood, D. (2004). *Nurse Safety: Investments in Equipment, Training Help Prevent Back Injuries.* Rn.Com. http://w3.rn.com/news_features.asp?articleID=10820 [https://web.archive.org/web/20061019002939/http://w3.rn.com/news_features.asp?articleID=10820]; Prevent, Inc. (2003). Mission. http://www.getalift.com/about.htm [https://web.archive.org/web/20050414020739/http://www.getalift.com:80/about.htm]	106 (103) nursing facilities	Zero-lift programs with mechanical lift assists		97% reduction in injuries Bogue reports that a study she conducted involving 103 nursing homes following her protocol showed the homes maintained a 90 percent reduction in lift-transfer injuries and had a 49 percent reduction in overall workers' compensation costs. Also, lift/transfer only: 93% reduction in costs, 95% reduction in injuries, 39% cost reduction, 19% injury reduction overall.	
Garg, A. and Owen, B. D. Reducing back stress to nursing personnel: an ergonomic intervention in a nursing home. Ergonomics. 1992; 35(11):1353-1375.	Nursing 57 employees	Implemented patient transferring devices.		LBP down 43% over 3.5 yrs IR of back injuries decreased from 83 to 43 per 200,000 work hours following the intervention; no lost or restricted work days during the 4 months following the intervention.	
Garg, 1997. Reducing safety and ergonomic hazards with a zero-lift program. Long Term Care. 1997; Nov./Dec.():26-27.	Hospital	Zero lift program		Lost workdays down 79%, back injuries down 78%, costs down 90%.	

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Garg, A. Long-term effectiveness of "zero-lift program" in seven nursing homes and one hospital. Wisconsin; 1999 Aug 16; U60/CCU512089-02.	Hospital, 754 employees	Zero lift program		Lost workdays down 62%, back injuries down 32%, costs down 55%.	
Ergonomic Success Stories, OSHA, November 1996. From Hospital Employee health (1995). Back program cuts comp costs, injuries, lost days. July 1995, 92-93	Hospital	Redesigned work process: Mechanical lifting equipment, slide boards, and patient transfer belts.		149 back injuries down to 85 (43%); nearly 1,000 lost days down to 426 lost days (57%); lost-time injuries reduced to 49 (down 35%); more than 4,000 restricted-duty days down to 1,851 (54%).	The average workers' comp cost per case was $2,207, for a total of $328,843 in 1993, down to $187,595 (43%) in 1994.
Ergonomic Success Stories, OSHA, November 1996. From Garg, A. & Owen, B. (Univ. of Wisconsin), Reducing back stress to nursing personnel: An ergonomic intervention in a nursing home.	Nursing home	Redesigned work process: Selection of patient transferring devices designed to produce less physical stress. Devices include walking belts and hoists. Mean compressive force on the L5/S1 disc 4751N down to 1964N, mean hand force to make a transfer 321N down to 122N, strength requirements 41% female pop, capable up to 83%.		Incidence rate for back injuries was 83 per 200,000 work hours down to 47 per 200,000 work hours.	
Ergonomic Success Stories, OSHA, November 1996. From Brigham, C.J. (1994). Ergonomic intervention. The 4th National Symposium and Trade exhibition on Health Care Safety and the Environment. February 13-16, 1994, Florida.	Hospital, perioperative setting	Redesigned work process: At least 4 people to transfer patient. Longer roller boards.		25% reduction in back injuries during the 18 months after intervention.	
Ergonomic Success Stories, OSHA, November 1996. From Charney, W., Zimmerman, K., & Walara, E. (1991). The lifting team: A design method to reduce lost time injury in nursing. AAOHN Journal, 39(5)231-234.	Hospital	Redesigned work process: Lifting teams for 95% of all patient transfers. The lifting teams, incorporates the latest body mechanics; uses transfer belts; mechanical lifting devices; and incorporates work/lift coordination. A team of two per shift had no problem with the average of 30 lifts per day.		Back injuries $229,500 per year, average cost of $9,000 per injury. Baseline rate of injury prior was 32 cases per 420 nurses in a two-year period. Back injuries among health care workers reduced 94% first year; 100% second year.	$135,000 per year saved in compensation costs; $70,000 a year increase in nursing productivity.
Ergonomic Success Stories, OSHA, November 1996. From Gauf, M. (1995) Giving health- care workers a helping, mechanical hand. In M. Gauf (Ed.), *Ergonomics That Work* (pp.73-77). Haverford, Penn.: CTD News.	Healthcare – hospital nursing	Ergonomics program in nursing and laundry. Redesigned work process: Worker-assisting devices to move patients from bed to bed, and from sitting position.		94 injuries, 7,716 lost-time hrs on nursing units in 1988- 1989. Incidence of back injuries in nursing wards 1988-1993 fell 39%; lost-time hrs dropped 83%.	$500,000 in workers' compensation in 1993, and $553,000 in 1994, total of $1.8 mil in 5 yrs.
Ergonomic Success Stories, OSHA, November 1996. From Gauf, M. (1995). Giving health- care workers a helping, mechanical hand. In M. Gauf (Ed.), *Ergonomics That Work* (pp73-77). Haverford, PA: CTD News	Healthcare laundry	Redesigned work process: Regularly scheduled maintenance program for equipment.		Injuries 1993-1994 decreased from 55 to 16 lost-time hrs reduced from 1481 to 284.	
Ergonomic Success Stories, OSHA, November 1996. From Brevillier Nursing Home Correspondence.	Nursing home	Redesigned work process: Lifting devices. Heavy lifting reduced by 80-85%.		Claims related to sprains and strains 12 down to 1 over three years. Total cost of claims $19,000 down to $118.00.	
Ergonomic Success Stories, OSHA, November 1996. From Don Estabrook, Safety Mgr, d'Youville Pavilion, Maine.	Nursing home	Medi-Man and Medi-Maid lifts		Workers' compensation reduced 50%; Improved morale, low turnover in CAN staff	
Ergonomic Success Stories, OSHA, November 1996. From Wyatt, R., C. Booth, R. Poirier, 1995, Reducing Employee Back Injuries in Skilled Nursing Facilities, Proceedings of the Institute of Industrial Engineers, 1995.	Nursing home	Suitable number of lifts, lifts that fit the patient		Incidence rates reduced approx 50%; greater job satisfaction	Benefit/cost were 3.04, 3.47, 3.25, 2.10 and 0.5

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Ergonomic Success Stories, OSHA, November 1996. From Brigham, C.J. (1994). Ergonomic intervention. The 4th National Symposium and Trade exhibition on Health Care Safety and the Environment. February 13-16, 1994, Florida.	Hospital	Redesigned work process: AIR PAL (Patient Air Lift) devices.	Total cost of the AIR PAL devices was under $22,000.	Indemnity cases dropped from 5.7 to 2.5 in the two years. The indemnity case cost $273,380 down to $73,380.	$200,000 over 2 years
Ergonomics Spotlight: Healthcare Facilities. (2004). EORM. http://www.eorm.com/ezine/pp7/ergo_healthcare.asp [https://web.archive.org/web/20080703152613/http://www.eorm.com/ezine/pp7/ergo_healthcare.asp]	Healthcare North Carolina	"No lift" policy		One year 60 cases down to seven; costs of $350,000 down to $8,200.	
Ergonomics Spotlight: Healthcare Facilities. (2004). EORM. http://www.eorm.com/ezine/pp7/ergo_healthcare.asp [https://web.archive.org/web/20080703152613/http://www.eorm.com/ezine/pp7/ergo_healthcare.asp]	Long-term care facility	Prevention program using mechanical lifting devices.		Back injuries were reduced 74% over a three-year period	
Ergonomics Spotlight: Healthcare Facilities. (2004). EORM. http://www.eorm.com/ezine/pp7/ergo_healthcare.asp [https://web.archive.org/web/20080703152613/http://www.eorm.com/ezine/pp7/ergo_healthcare.asp]	Ledgewood Manor, a skilled/intermediate care facility in Windham, Maine	Installation of fixed ceiling lifts		Six months Workers' Compensation costs reduced by 60%. At 20 months, zero (0) back injuries related to patient transfers reported and Workers' Comp costs decreased 97%.	
OSHA Final Ergonomics Standard, November 2000	Nursing Home	No single person lift policy, mechanical lift equipment.		Lost workdays reduced 80%	
Nyran, P. I. Cost effectiveness of core-group training. Advances in Industrial Ergonomics and Safety III. 1991	Hospital	Train-the-trainer		MSDs down 66%, costs down 75%.	
Laflin, K. and Aja, D. Health care concerns related to lifting: an inside look at intervention strategies. The American Journal of Occupational Therapy. 1995; 49(1):63-72.	Hospital 1,050 employees				
Bernacki, E. J.; Guidera, J. A.; Schaefer, J. A.; Lavin, R. A., and Tsai, S. P. An ergonomics programs designed to reduce the incidence of upper extremity work related musculoskeletal disorders. Journal of Occupational and Environmental Medicine. 1999; 41(12):1032-1041.	Hospitals, 18,000 employees	Program aimed at the early diagnosis and treatment of potential upper extremity work related musculoskeletal disorders , ergonomic assessment and abatement of work areas where individuals with UEWMSDs are employed, identification and correction of areas throughout the hospital and university where UEWMSDs could possibly occur		UEWMSDs down 80% over 7 years. Initial increase in the number and cost for the treatment of UEWMSDs. Subsequently, there was a significant decrease in the number of UEWMSDs reported and virtual elimination of the need to use surgical procedures to correct these conditions.	
Evanoff, B. A.; Bohr, P. C., and Wolf, L. D. Effects of a participatory ergonomics team among hospital orderlies. American Journal of Industrial Medicine. 1999; 35():358- 365.	Hospital, 105 employees	Formation of a participatory ergonomics team with three orderlies, one supervisor, and technical advisors. This team designed and implemented changes in training and work practices.		MSDs down 50%, lost workdays down 83%, costs down 41% over two years.	
McGrail Jr., M. P.; Tsai, S. P., and Bernacki, E. J. A comprehensive initiative to manage the incidence and cost of occupational injury and illness. Report of a outcomes analysis . Journal of Occupational and Environmental Medicine. 1995; 37(11):1263-1268.	Hospital, 13,895 employees	A comprehensive initiative utilizing an in-house preferred provider organization, medical case management, and application of ergonomic techniques.		MSDs down 18% over 2 years. Significant decrease in injuries and illnesses (53/1000 vs 27/1000, P <.01) and average days lost per event (10.4 vs 6.6 days, P <.01). A significant increase in restricted-duty days (.2 vs 1.5 days, P <.01) and an 18% reduction in medical and indemnity costs of the institution's workers' compensation expenditures	
Rosald, et al, and Spiegel et al, (2002) AAOHN 50(3), pgs. 120-127 and 128…	Hospital	Implemented ceiling lifts in patient rooms, did not reach into bathrooms, not usable for repositioning. Estimated benefits over 12-year period.	$344,323	58% decline in lift/transfer injuries, cost benefit 1:6, internal rate of return 17.9%. Costs of injury reduced 69% ($65,997 down to $20,731 per 100,000 hours). Payback 1.3 years (all factoring in indirect costs of 2x direct costs).	$872,372 projected over 12 years.

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Evanoff, B., Wolf, L., Aton, E., Canos, J. and Collins, J., (2003). Reduction in injury rates in nursing personnel through introduction of mechanical lifts in the workplace. *American Journal of Industrial Medicine, 44*, 451-457.	Acute Care and Long Term Care	Full-body and sit-to-stand lifts, 2- hour, hands-on instruction Data collected between 1997-8 to end of 2000.		Acute care: 13% reduction in injury rate (6.59 down to 5.70); 53% reduction in lost workday injury rate (32.0 down to 14.9); 33% reduction in lost day rate (3.00 down to 2.02) Long term care: 29% reduction in injury rate (6.90 down to 4.92); 72% reduction in lost workday injury rate (3.13 down to 0.89); 66% reduction in lost day rate (49.04 down to 16.82)	