Appendix F: Ergonomic Intervention Studies

Authors	Industry/ Occup.	Study Design Type	Control Group included	Time	MSD Observed	Size	Reduction in: Lost work days (LWD)	Reduction in: Number of injuries	Reduction in Health Costs (%) Total MSD	Reduction in Health Costs (%) Cost per case	Miscell.
Sinclair et al, 1997	WCB registrants	Cross	Y	1 yr	Soft tissue	1825					
Melhourn, 1999	Financial Institution	Cross	Y	1 yr	MSD	82					
Parenmark et al '88 #	Manuf. Workers	Cross	Y	1 yr	UECTDs	30	50%				
Shi, 1993	County employees	Pre/post	Y	1 yr	Back	205	38%	38%	33%	13%	ROI= 1.8
Helander et al, 1995	Electronics manu.	Pre/post	N	12 yr	MSD			19%			
GAO 1997	Financial Institution	Pre/post	N	4 yr	MSD	8000			80%	81%	
GAO 1997	Electronics manu.	Pre/post	N	3 yr	MSD	300		45%	62%	62%	
GAO 1997	Assembly plant	Pre/post	N	5 yr	MSD	4000		30%	60%	50%	
GAO 1997	Health care	Pre/post	N	3 yr	MSD	775		16%	35%	-20%	
GAO 1997	Defense systems	Pre/post	N	3 yr	MSD	2800		73%	91%	76%	
Garg et al, 1992	Nursing	Pre/Post	Y	3.5 yr	LBP	57		43%			
Narayan et al, 1993	Assembly workers	Pre/post	Y	1 yr	MSD	156	99%	80%			
Riley et al, 1994	Meatpacking workers	Pre/post	N	2 yr	CTD	815		20%			Turnover =-3%
Smith, 1994	Food prod workers	Pre/post	N	1 yr	MSD	200		50%			
Village et al, 1994 #	Wood Ind. Workers	Pre/post	N	3 yr	MSD	(large)		20%			
Oxenburgh, 1990	Packaging (#10)	Pre/post	N		MSD	330	100%				Prod. = 25%
Oxenburgh, 1990	Restuarant (#17)	Pre/Post	N		MSD	43	3%	40%			Prod. = 10%
Oxenburgh, 1990	Elect. Manu (#42)	Pre/Post	N		MSD			29%			Prod. = 25%
Oxenburgh, 1990	Meat Process(#45)	Pre/Post	N		MSD			80%			
Garg, 1997	Hospital	Pre/post	N	2.5 yr	Back		79%	78%	90%		
Garg, 1999	Nursing Home & Hospital		N	7 yr	Back	754	62%	32%	55%		
Stuart-Buttle '94	Poultry processing	Pre/post	N		MSD	1000	83%	36%	70%		
Holland, 1991	Light Manu.	Pre/post	N	6 yr	MSD	700		62%	89%		
Ridyard et al, 2000	Beverage Packaging	Pre/post	N		MSD	140	74%	11%			
Authors	**Industry/ Occup.**	**Study**					**Reduction in:**		**Reduction in Health Costs (%)**		

		Design Type	Control Group included	Time	MSD Observed	Size	Lost work days (LWD)	Number of injuries	Total MSD	Cost per case	Miscell.
Nerhood et al, 1994	Parcel service	Pre/post	N		MSD			50%	100%		
Nyran, 1991	Hospital	Pre/post	N		MSD			66%	75%		
Getty, 1999	Aircraft manu.	Pre/post	N		MSD		25%		55%		
Narayan et al, 1993		Pre/post	N		MSD	316	97%	83%			Payback period= 2.3 months
Tadano, 1990	VDT operators	Pre/post	N	0.5 yr	MSD	500		51%	43%		
NIOSH, 1994	Motorcycle Manu.	Pre/post	N	3.66 yr	MSD	48		55%			
Worrell et al, 1999	Beef packing plant	Pre/post	N	1 yr	MSD		100%	71%	100%		
L&I, Seattle City Light	Public Utility	Time Series	N	3-4 yr	MSD	1804		63%	66%	10%	
L&I, Xerox report	Document equipment	Time Series	N	8 yr	MSD	50000		24%	56%		
Laflin et al, 1995	Hospital	Time Series	N	2 yr	MSD	1,050					
Oxenburgh, 1997	Manufacturing (sm.)	Time Series	N	2 yr	Upper limb		68%				
Oxenburgh 1997	Engine Mantenance (Lg)	Time Series	N	2 yr	MSD		60%				
Bernacki et. al.	Hospitals	Time Series	N	7 yr	UECTDs	18000		80%			
Evanoff et al, 1999	Hospital	Time Series	N	2 yr	MSD	105	83%	50%	41%		
Lanoie et al, 1998	Packers	Time Series	N	6 yr	Back	274	53%	36%			
Hochanadel et al, 1993	Industrial	Time Series	N	10 yr	LBP	2900	80%				
Melhourn, 1996	Aircraft	Time Series	N	15 mo.	UECTDs	212					
Parenmark et al, 1993	Manufacturing Engineering Ind.	Time Series	Y	3 yr	MSD	279	15%				Turnover =-25
Moore et al, 1997	Red Meat packing	Time Series	N	7 yr	MSD	830		8%	77%		
Jones, 1997	Poultry Processing	Time Series	N	5 yr	MSD	12,000		46%			
Mansfield et al, 1997	Library	Time Series	N	2 yr	MSD	4,570					
Wiesel et al, 1994	Public Utility	Time Series	Y	10 yr	MSD	5,300					
Henderson et al, 1994	Turkey production	Time Series	N	5 yr	MSD	2,500			40%		ROI=3.0
Wickstrom et al, 1993	Metal Industry	Time Series	N	5 yr	LBP	213					
McGrail et al, 1995	Hospital	Time Series	N	2 yr	MSD	13,895			18%		
Mckenzie et al, 1985	Telecomm manu.	Time Series	N	2 yr	MSD	6,600	84%	55%			

Authors	Industry/ Occup.	Study Design Type	Control Group included	Time	MSD Observed	Size	Reduction in: Lost work days (LWD)	Reduction in: Number of injuries	Reduction in Health Costs (%) Total MSD	Reduction in Health Costs (%) Cost per case	Miscell.
Aaras, 1994	Assembly workers	Time Series	N	8 yr	MSD	331	60%				
Chatterjee, 1992	Automotive workers	Time Series	N	1 yr	UECTDs	695		95%			
Echard et al, 1987	Automotive workers	Time Series	N	2 yr	Carpal Tunnel			>50%			
Geras et al, 1989 #	Automotive workers	Time Series	Y	5 yr	MSD		70%				
Lifshitz et al, 1991 #	Automotive workers	Time Series	Y	2 yr	CTD	(large)		50%			
Lockhart, 1986 #	Electric utilty workers	Time Series	Y	3 yr	MSD	4,000		58%			
Ridyard 1990	Chem prod workers	Time Series	N	3 yr	Back	90	62%				
Tadano 1990	VDT workers	Time Series	N	0.5 yr	MSD	500		40%			
Fitzler et al, 1983 #	Manuf. Workers	Time Series	N	3 yr	Back	400		50%	90%		
Townes et al, 1991	Electronics manu.	Time Series	N		UECTDs	6					Prod.=10 .24%
Thompson et al, 1986	Data entry	Time Series	N	1 yr	MSD		58%	100%			
Spilling et al, 1986	Telecomm manu.	Time Series	N	12 yrs	MSD		57%				

#. As cited in R.H. Westgaard and J. Winkel. 1997. Ergonomic Intervention Research for Improved Musculoskeletal Health: A Critical Review. *International Journal of Industrial Ergonomics*, v. 20, no. 6, pp. 463-500.