



# The Use of Work Role Functioning in Evaluating an Ergonomic Intervention

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## Ergonomics Intervention Sources of Support



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**HWO**

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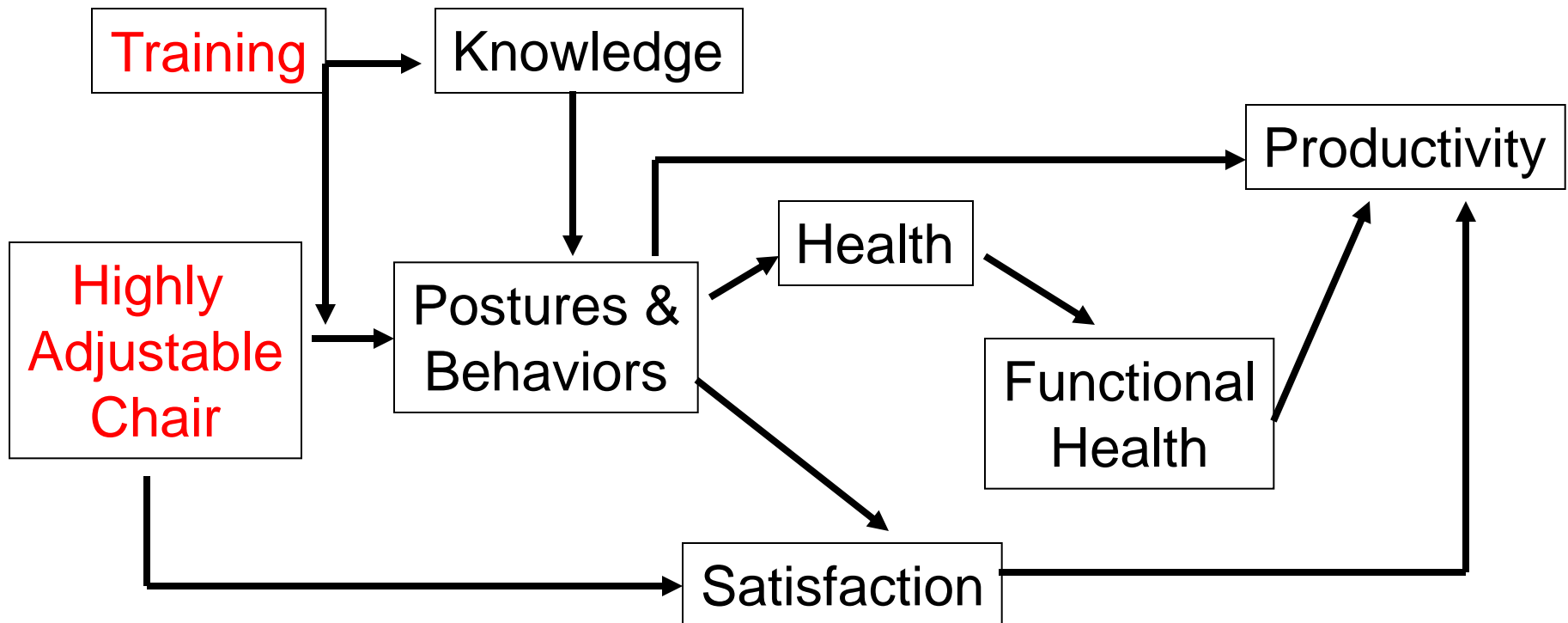


## The Interventions

- Highly-adjustable ergonomic chair:
  - Benefits come from chair adjustability and human engineering design features
- One time state-of-the-art ergonomic training with e-mail follow-ups:
  - Helps users get the most out of their chairs
  - Chair-with-Training and Training-only groups equally maximize the ergonomics of their overall work station
  - Based on instructional system design principles and adult learning theories

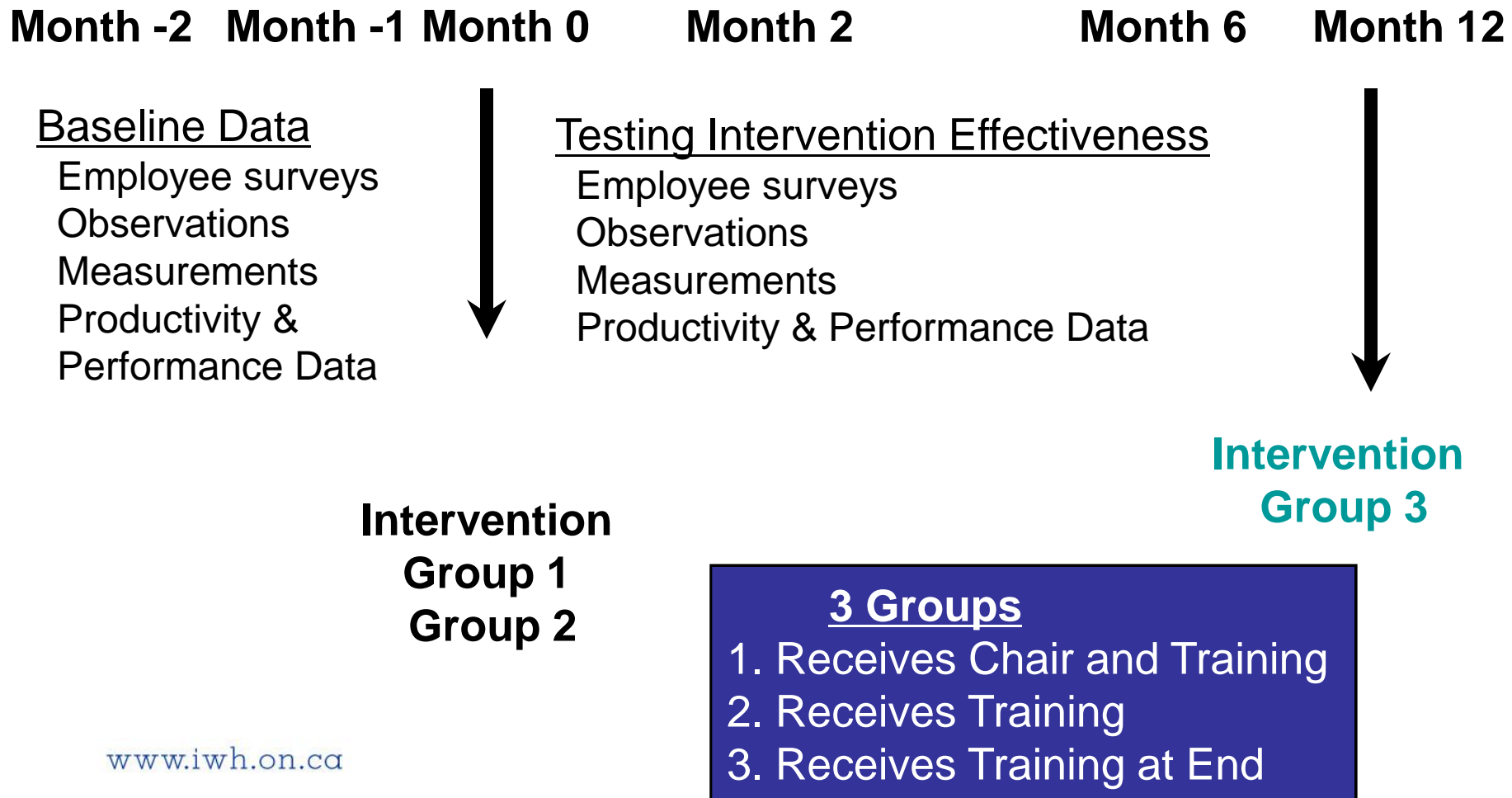


## The Theory of Change



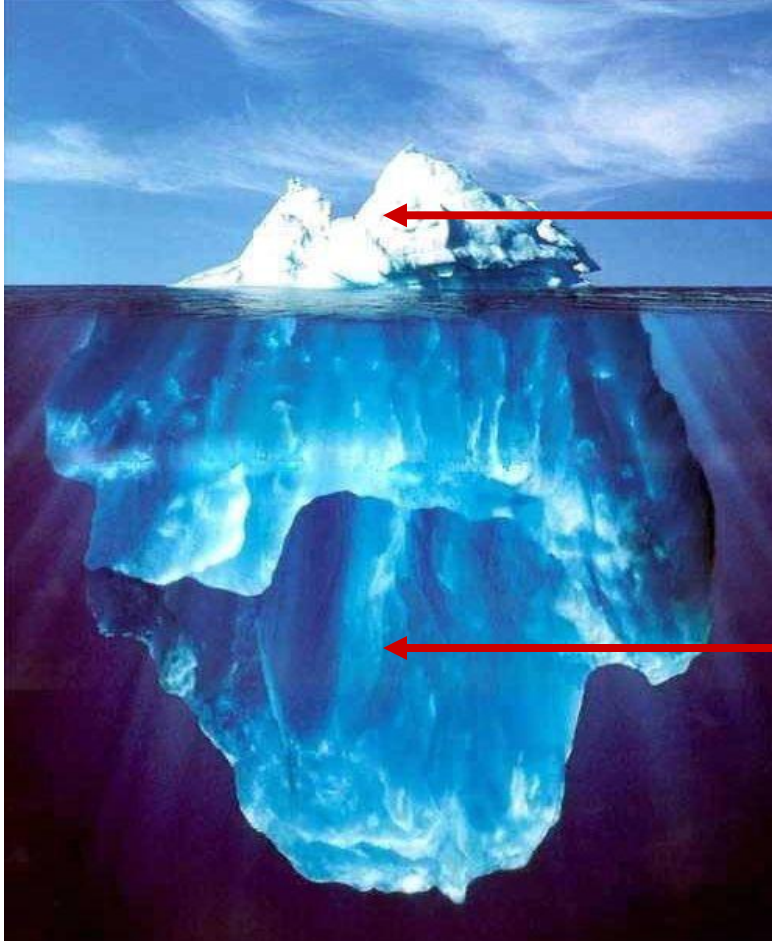


## Study Timeline





## Work Role Functioning



**Absenteeism**  
(Lost Time)

**Presenteeism**  
(Limitations in the  
ability to meet the  
work requirements  
while working)



## Work Role Functioning: WRF-27

- 27 Items covering 5 work dimensions: time management (work scheduling), physical demands, social demands, psychological demands, output demands
- Response categories anchored by % of time to facilitate development of cost algorithms
- Respond about the past 4 weeks
- Applicable to a range of jobs in the economy
- Employs a 'Does Not Apply to My Job' category
- Applicable to a range of illness and disease states



## Measuring Work Role Functioning

In the past 4 weeks, how much of the time did your physical health or emotional problems make it difficult for you to do the following:

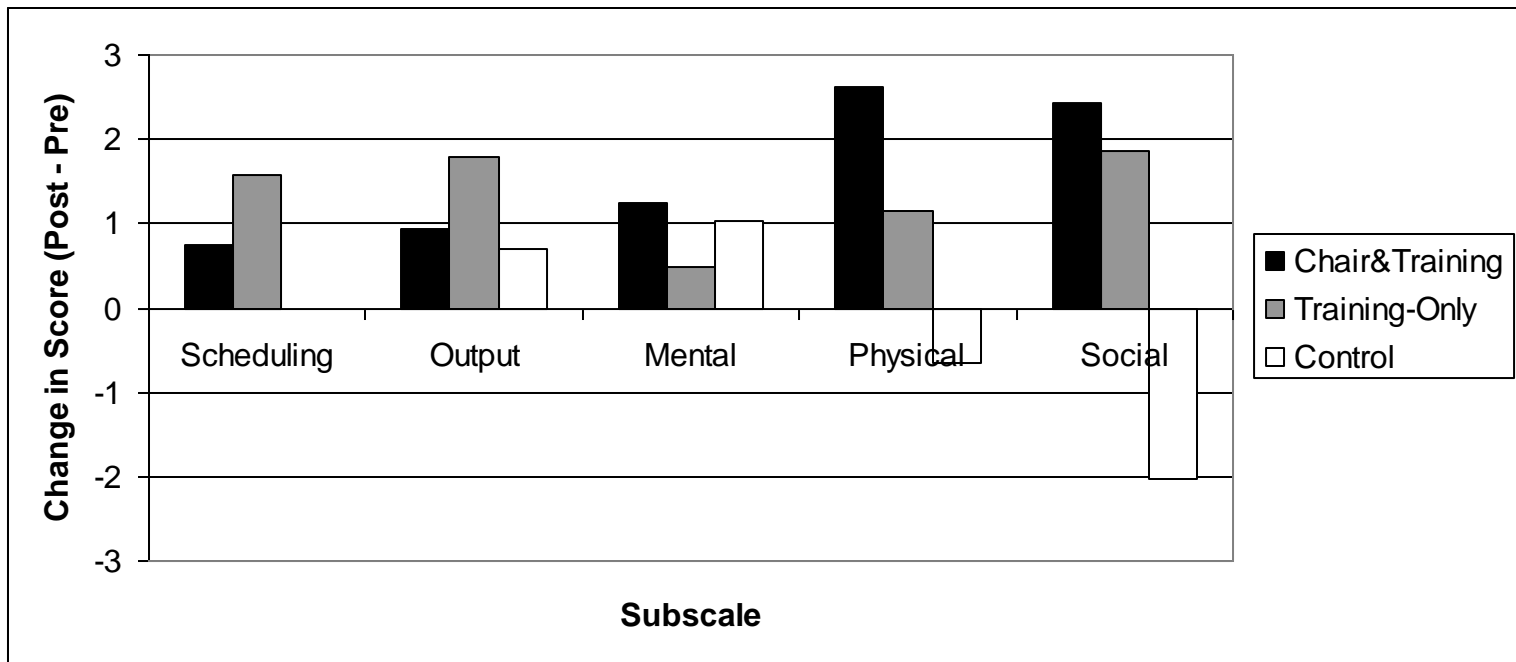
All of The Time (100%)	Most of The Time	Half of The Time (50%)	A Slight Bit of The Time	None of The Time (0%)	Does Not Apply to My Job
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**Start on job as  
soon as you  
arrived at work**





## Impact of Intervention on Functional Improvement



After adjusting for general health and rest breaks the effects were significant for mental, physical and social work role functioning



# What Happens When You Look at Different Levels of Work Role Functioning?

Variable	Working Well (WRF > 90%)		Working Hurt (WRF 75-90%)		Working Injured (WRF < 75%)	
	$\beta$	p	$\beta$	p	$\beta$	p
Chair w/ Training Group	-0.46	0.72	-0.50	0.73	0.16	0.96
Training Only Group	0.47	0.74	-0.65	0.68	2.26	0.55
Intervention	-0.93	0.44	-1.37	0.25	8.39	0.00
Chair w/ Training * Intervention	<b>-0.74</b>	<b>0.61</b>	<b>4.91</b>	<b>0.00</b>	<b>6.20</b>	<b>0.08</b>
Training Only * Intervention	<b>-2.41</b>	<b>0.15</b>	<b>5.51</b>	<b>0.00</b>	<b>1.01</b>	<b>0.79</b>
Forceful Hand/Wrist Activity	-0.19	0.45	-0.36	0.22	-0.77	0.26
Medication Strength	-1.56	0.00	-1.43	0.01	1.61	0.19
General (Poor) Health	-0.85	0.07	-0.88	0.13	-2.24	0.09
Decision Authority	0.07	0.20	0.18	0.01	0.34	0.02
Constant Term	<b>96.06</b>	<b>0.00</b>	<b>81.57</b>	<b>0.00</b>	<b>56.58</b>	<b>0.00</b>



## To Summarize

- Work role functioning improves when an ergonomic intervention is implemented
- The effects are primarily for mental, physical and social demands, not work scheduling or output demands
- The effects are most significant for workers with poor pre-intervention functioning who improve about 15 points or almost
  - note prior work suggest a 10 point improvement is associated with a 4% real productivity improvement
- Presenteeism measures can be useful measures in ergonomic interventions
- Care should be taken to examine the between scale variability and between individual variability and not simply rely on average values



## Research Team

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## Key Chair Design Features

- Height, width and pivot adjustable arm rests
- Chair height adjustments
- Flexible full back support
- Adjustable low back firmness with seat depth adjustment
- Gliding mechanism for the back support and seat pan



## Training Design Objectives

- To recognize work-related musculoskeletal disorders and risk factors
- To understand the importance of varying postures
- To know how to rearrange the workstation to maximize the 'comfort zone'
- To recognize and understand visual issues
- To reduce visual discomfort
- To understand rest breaks are necessary for healthy computing
- To know how to change work-rest patterns
- To be aware of companies existing health and ergonomic programs
- To know how to obtain ergonomic accessories through the companies program