

# Designing an MSD Mobile App

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Ergonomist

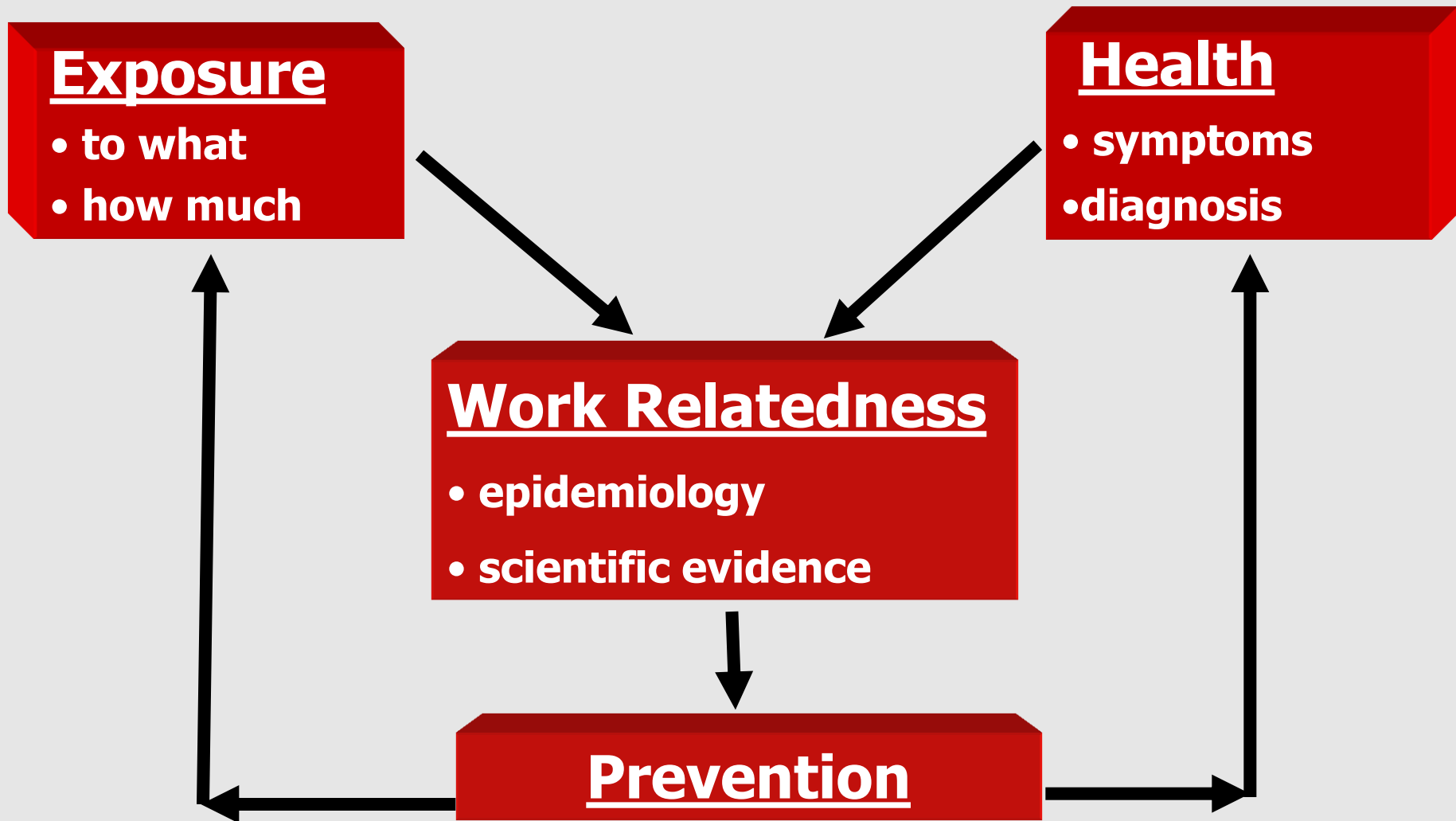
OHCOW (Hamilton)

# Overview

- OHCOW Approach
- Basis for the app
- Use of body maps in workplaces
- OHCOW Survey Tool
- The design of the OHCOW app



# What OHCOW Does



# Basis of the App



International Journal of Industrial Ergonomics 17 (1996) 21–27

International Journal of

**Industrial  
Ergonomics**

## An improved musculoskeletal discomfort assessment tool

Robert J. Marley<sup>\*</sup>, Nirmal Kumar

*Industrial and Management Engineering Department, 315 RH, Montana State University, Bozeman, MT 59717-0384, USA*

Received 15 June 1994; revised 15 September 1994

Occupational  
Health Clinics  
for Ontario Workers

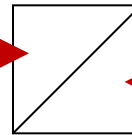


Centre de Santé  
des Travailleurs(s)  
de l'Ontario

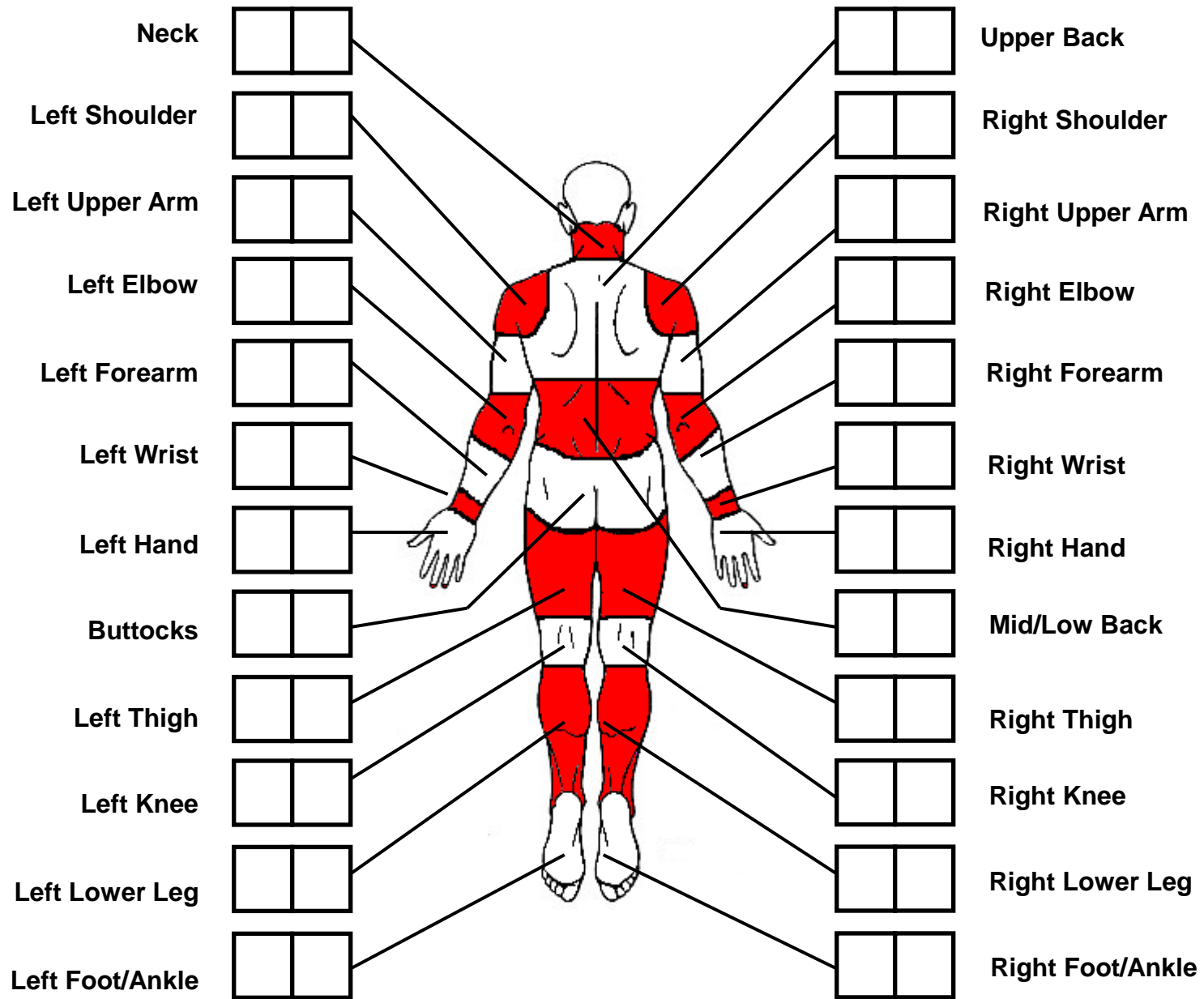
# Discomfort Scales

0	no discomfort
1	
2	fairly comfortable
3	
4	
5	moderate discomfort
6	
7	
8	very uncomfortable
9	
10	extreme discomfort

**Neck**



A/0 = Never  
B/1 = Rarely  
C/2 = Frequently  
D/3 = Constantly



## Legend

<b>1</b>	Not likely to seek treatment
<b>2</b>	Somewhat likely to seek treatment
<b>3</b>	Very likely to seek treatment

Frequency Discomfort	<b>B</b> = Rarely	<b>C</b> = Frequently	<b>D</b> = Constantly
<b>1</b>	1	1	1
<b>2</b>	1	1	1
<b>3</b>	1	2	2
<b>4</b>	1	2	2
<b>5</b>	1	2	3
<b>6</b>	2	3	3
<b>7</b>	2	3	3
<b>8</b>	2	3	3
<b>9</b>	3	3	3
<b>10</b>	3	3	3

**USE IN WORKPLACES**

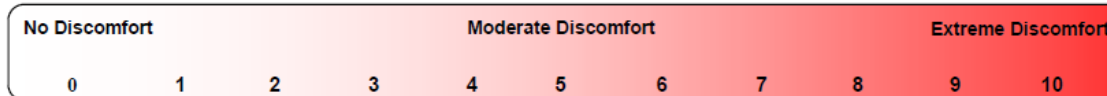




# Offices

## Discomfort

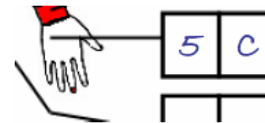
Based on the scales below, please indicate the **amount of discomfort** you have felt at work **in the last month** and **how often** you experience it for **each body region**. An example is provided below.



## Frequency

Never	Rarely (few/month)	Frequently (few/week)	Constantly (nearly daily)
A	B	C	D

EXAMPLE:



A worker is experiencing moderate discomfort in the hand or finger frequently (3 times a week)

Neck	0	A	Upper Back	0	A
Left Shoulder	0	A	Right Shoulder	0	A
Left Upper Arm	0	A	Right Upper Arm	0	A
Left Elbow	0	A	Right Elbow	0	A
Left Forearm	0	A	Right Forearm	0	A
Left Wrist	0	A	Right Wrist	0	A
Left Hand	0	A	Right Hand	0	A

# Exposure Questions

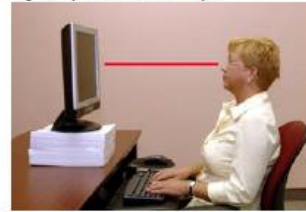
- We also asks questions related to physical exposures in the workplace
- This has varied based on the type of work environment



# Offices

Please answer the following questions based on your overall experience in the last week.

15. Where is your computer screen in relation to your eyes (choose one)?

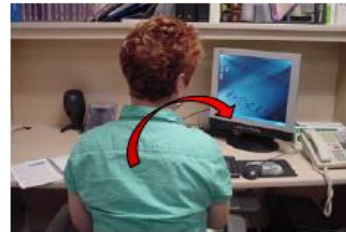


Looking level

Looking down

Looking up

16. Where is your computer screen located (choose one)?



Directly in front

Off to a side

17. How do you position your wrist most often when you are mousing?



Straight and level

Bent inwards

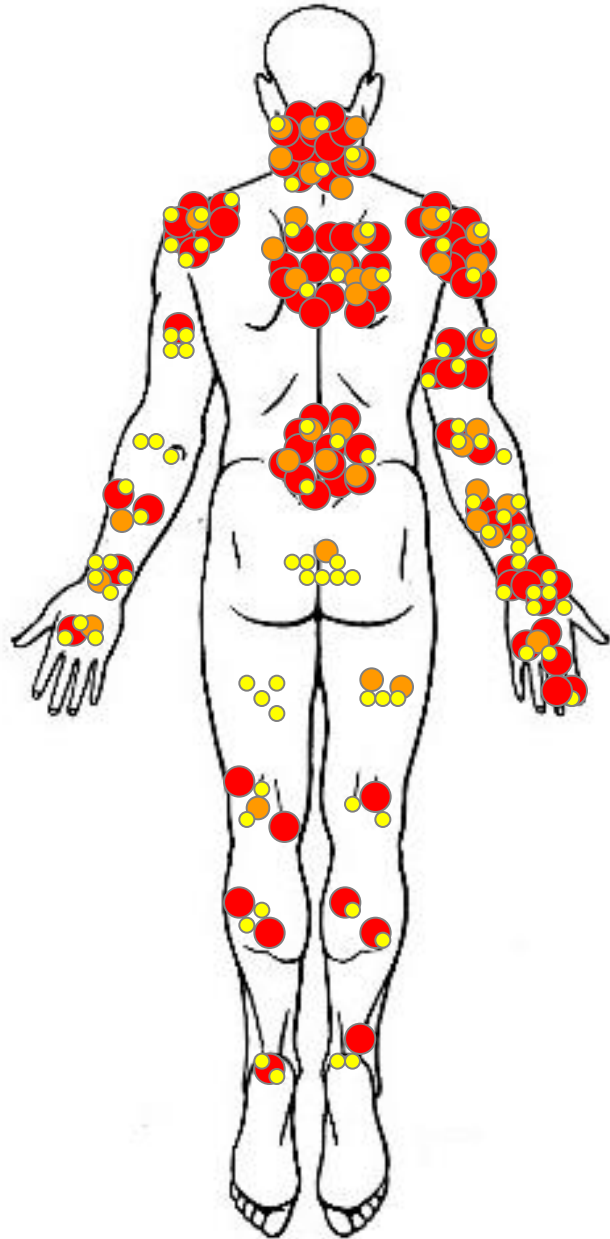
Bent Outwards

Bent Upwards

# Industrial

1. Overall, how would you rate the <u>comfort of your workstation</u> (circle one)?				
Comfortable <sub>1</sub>	Neutral <sub>2</sub>	A Bit Uncomfortable <sub>3</sub>	Annoying <sub>4</sub>	Very Uncomfortable <sub>5</sub>
2. Do you have to <u>bend your back</u> in order to do your work (circle one)?				
Never <sub>0</sub>	Rarely <sub>1</sub>	Once in a While <sub>2</sub>	Regularly <sub>3</sub>	All the Time <sub>4</sub>
3. Do you have to <u>stand in one place</u> for an extended period of time (circle one)?				
Never <sub>0</sub>	Rarely <sub>1</sub>	Once in a While <sub>2</sub>	Regularly <sub>3</sub>	All the Time <sub>4</sub>
4. Do you have to <u>stretch to reach</u> in order to do your work (circle one)?				
Never <sub>0</sub>	Rarely <sub>1</sub>	Once in a While <sub>2</sub>	Regularly <sub>3</sub>	All the Time <sub>4</sub>
5. Do you have to <u>twist your body</u> in order to do your work (circle one)?				
Never <sub>0</sub>	Rarely <sub>1</sub>	Once in a While <sub>2</sub>	Regularly <sub>3</sub>	All the Time <sub>4</sub>
6a. Do you need to <u>lift things</u> in order to do your work (circle one)?				
Never <sub>0</sub>	Rarely <sub>1</sub>	Once in a While <sub>2</sub>	Regularly <sub>3</sub>	All the Time <sub>4</sub>
6b. How would you rate the <u>effort of lifting</u> (circle one)?				
Never <sub>0</sub>	Rarely <sub>1</sub>	Once in a While <sub>2</sub>	Regularly <sub>3</sub>	All the Time <sub>4</sub>
7a. Do you need to <u>push or pull</u> in order to do your work (circle one)?				
Never <sub>0</sub>	Rarely <sub>1</sub>	Once in a While <sub>2</sub>	Regularly <sub>3</sub>	All the Time <sub>4</sub>
7b. How would you <u>rate the effort of pushing or pulling</u> (circle one)?				
Never <sub>0</sub>	Rarely <sub>1</sub>	Once in a While <sub>2</sub>	Regularly <sub>3</sub>	All the Time <sub>4</sub>
8a. Do you have to <u>grip anything</u> in order to do your work (circle one)?				

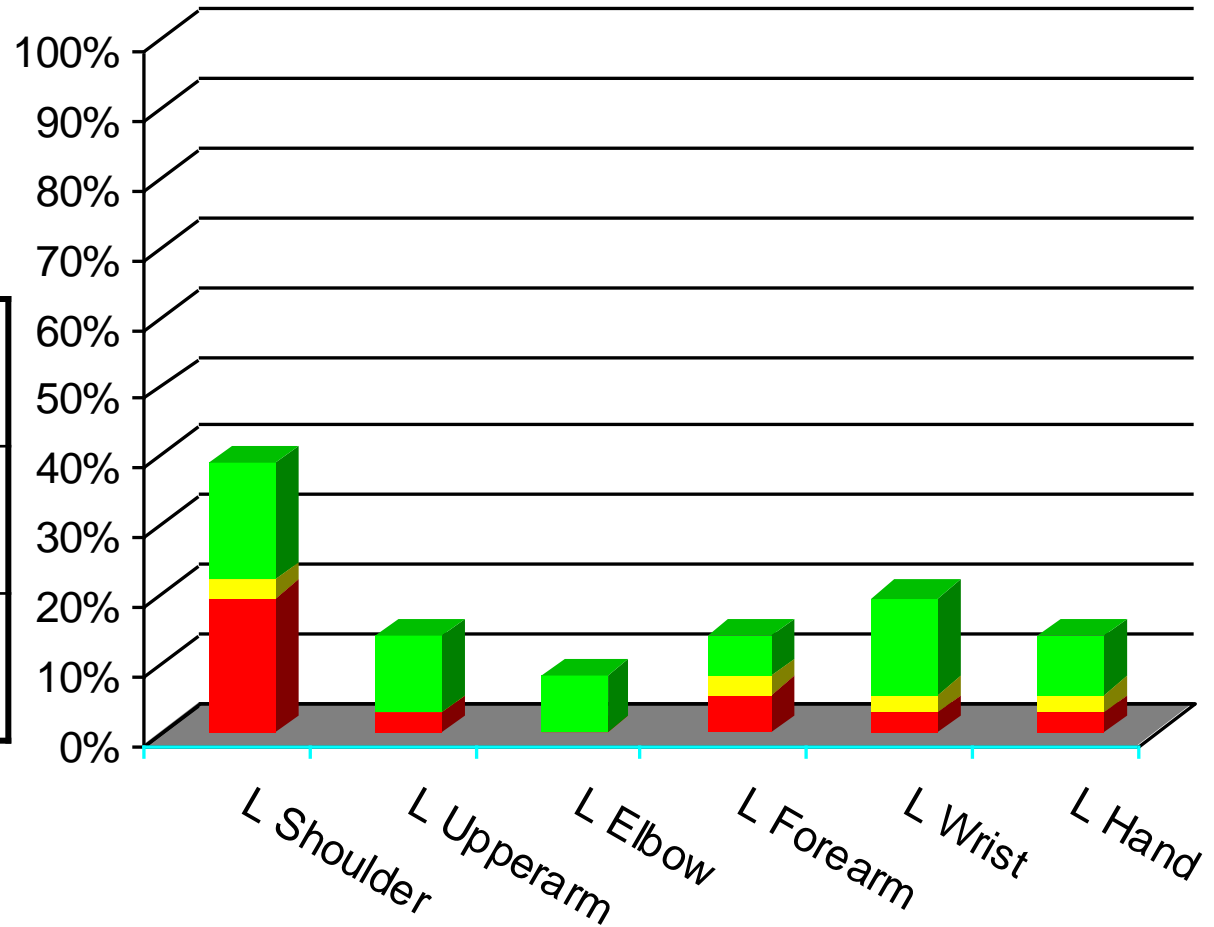
# Department X (n=36)



1	Not likely to seek treatment
2	Somewhat likely to seek treatment
3	Very likely to seek treatment

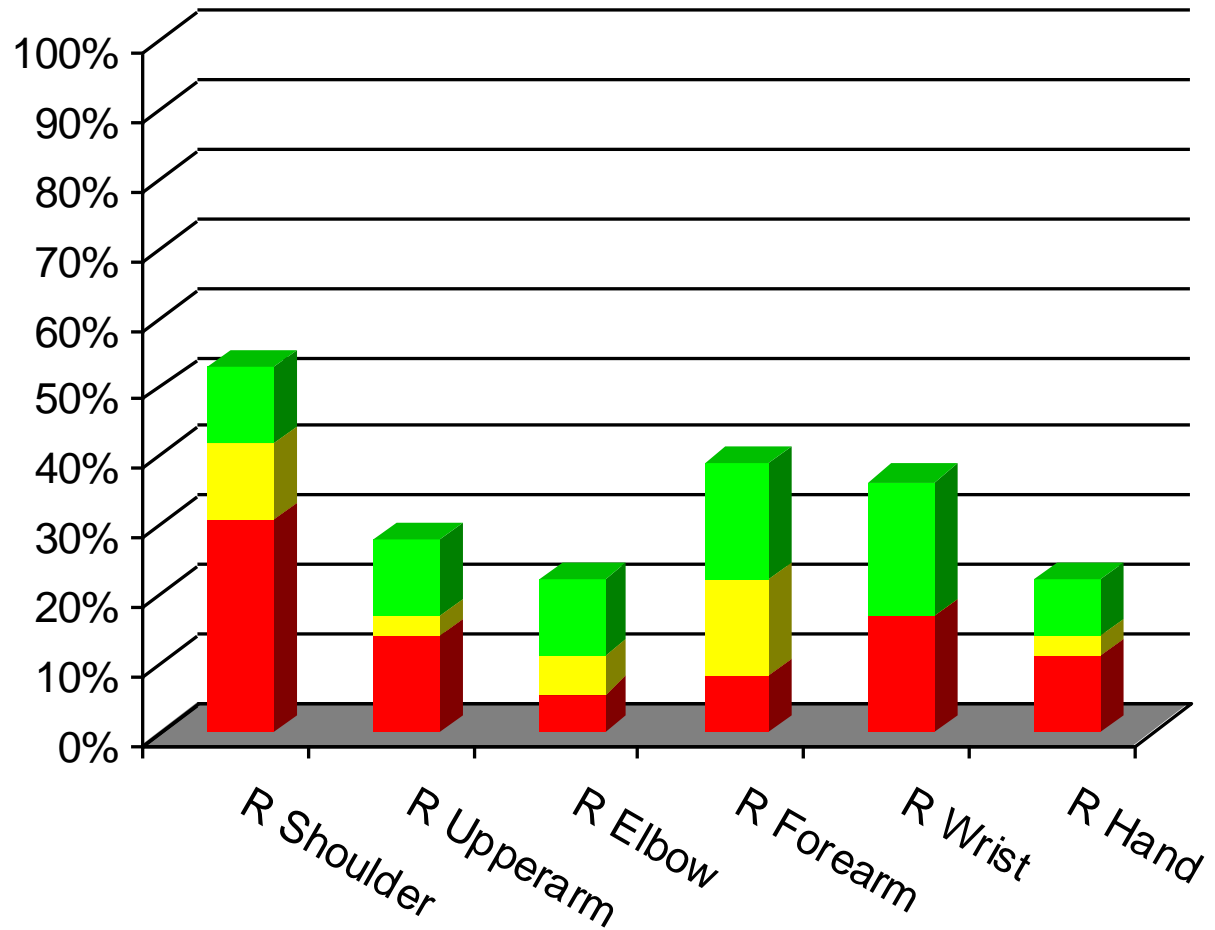
# Department X Left Side

1	Not likely to seek treatment
2	Somewhat likely to seek treatment
3	Very likely to seek treatment



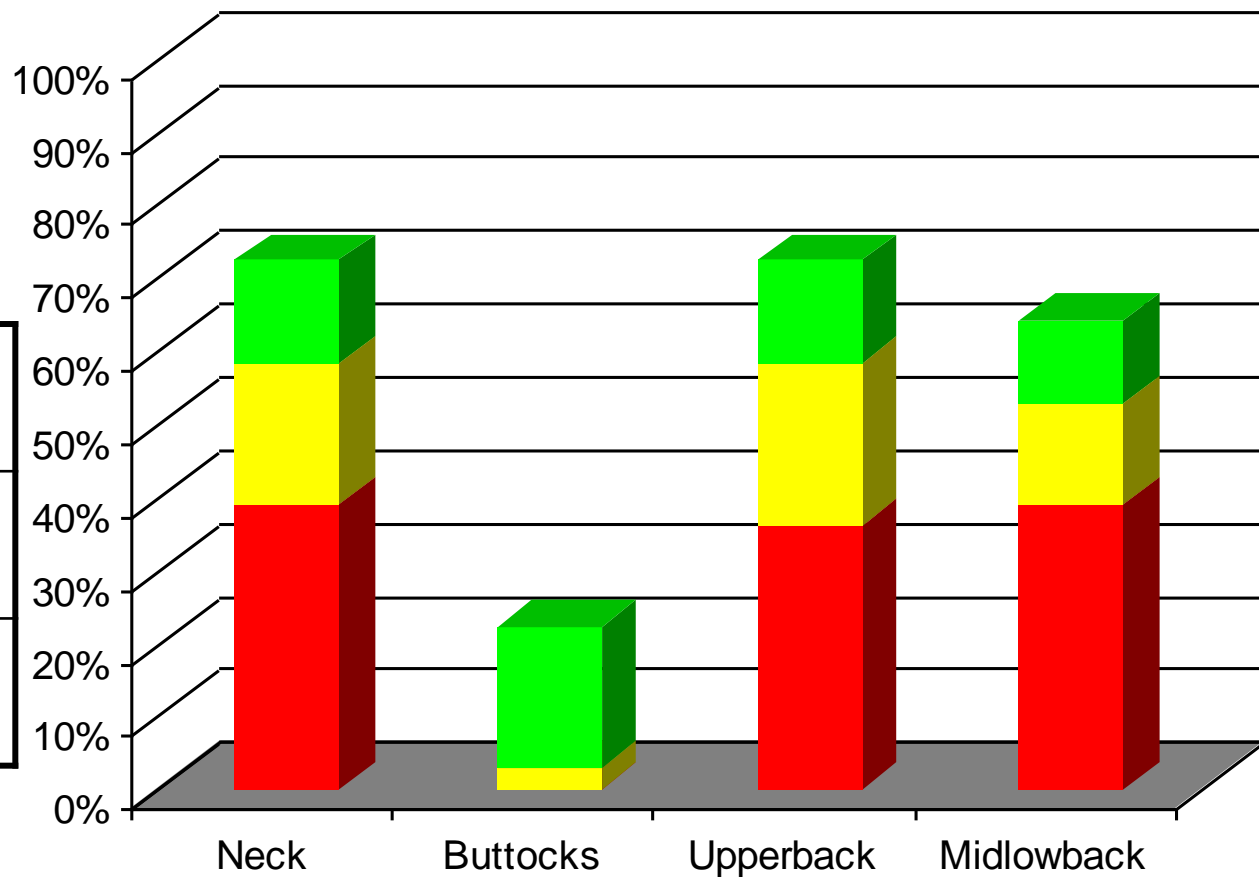
# Department X Right Side

1	Not likely to seek treatment
2	Somewhat likely to seek treatment
3	Very likely to seek treatment



# Department X Neck and Back

1	Not likely to seek treatment
2	Somewhat likely to seek treatment
3	Very likely to seek treatment



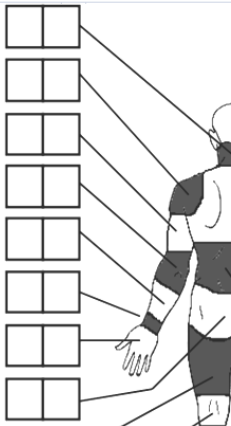


# OHCOW SURVEY TOOL



# Spreadsheet Entry

F17		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1	enter group name here (type over)		ID number:																							
2	department:																									
3	line:																									
4	job:																									
5	age category:																									
6	sex:																									
7	right or left handed:																									
8																										
9	NECK	<input type="checkbox"/>	<input type="checkbox"/>																							
10	LEFT SHOULDER	<input type="checkbox"/>	<input type="checkbox"/>																							
11	LEFT UPPER ARM	<input type="checkbox"/>	<input type="checkbox"/>																							
12	LEFT ELBOW	<input type="checkbox"/>	<input type="checkbox"/>																							
13	LEFT FOREARM	<input type="checkbox"/>	<input type="checkbox"/>																							
14	LEFT WRIST	<input type="checkbox"/>	<input type="checkbox"/>																							
15	LEFT HAND	<input type="checkbox"/>	<input type="checkbox"/>																							
16	BUTTOCKS	<input type="checkbox"/>	<input type="checkbox"/>																							

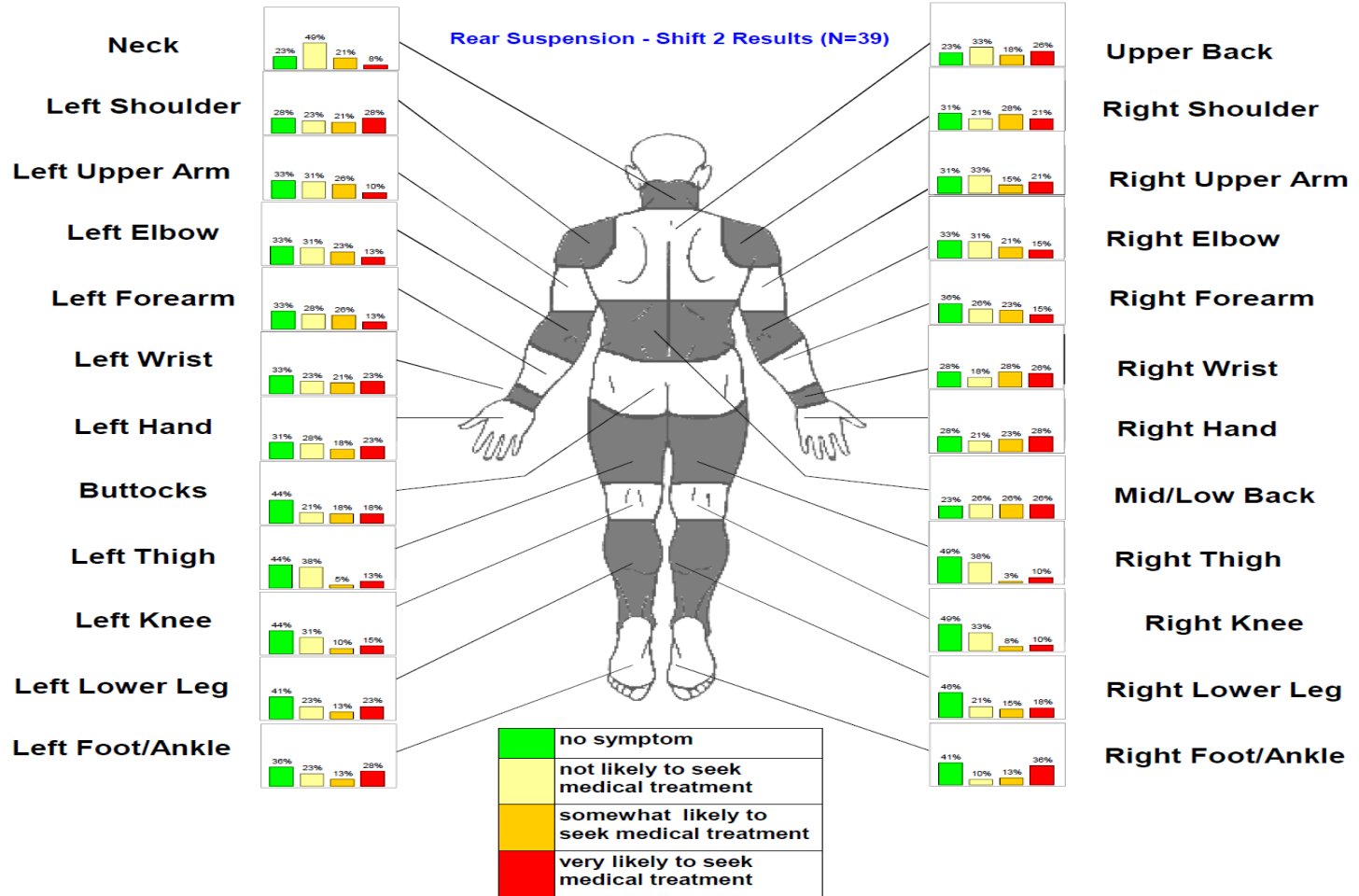


# Spreadsheet Entry

29		RIGHT THIGH										
30		RIGHT KNEE										
31		RIGHT LOWER LEG										
32		RIGHT ANKLE OR FOOT										
33												
34	<b>q1: workstation comfort rating</b>											
35	<b>q2: bending</b>											
36	<b>q3: standing in one place</b>											
37	<b>q4: stretching to reach</b>											
38	<b>q5: twisting</b>											
39	<b>q6a: lifting frequency</b>											
40	<b>q6b: lifting effort</b>											
41	<b>q7a: push/pull frequency</b>											
42	<b>q7b: push/pull effort</b>											
43	<b>q8a: gripping frequency</b>											
44	<b>q8b: gripping effort</b>											
45	<b>q9: shoulder work</b>											
46	<b>q10: number of repetitions</b>											
47	<b>q11: vibration exposure</b>											
48	<b>Suggestions:(keep typing even if you go beyond space</b>											

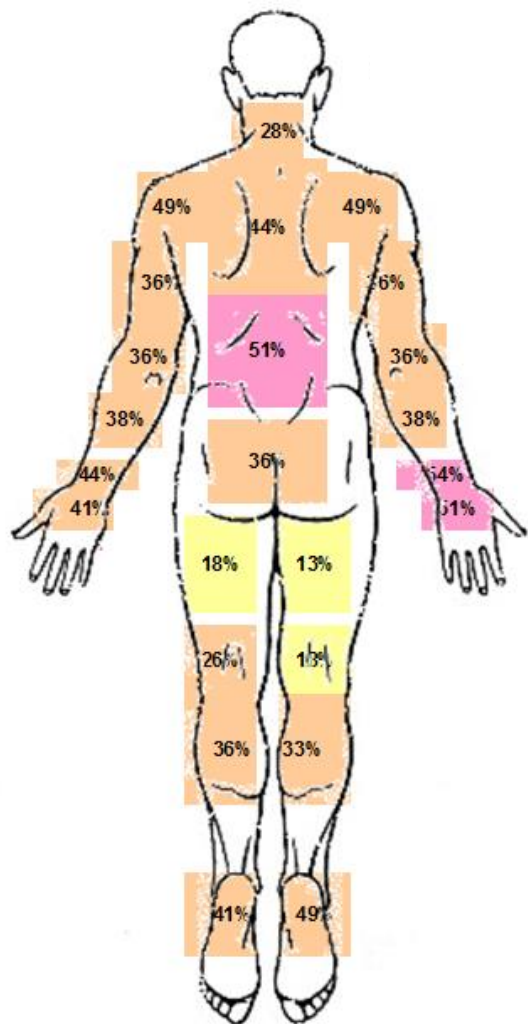


# Department X (N=39)

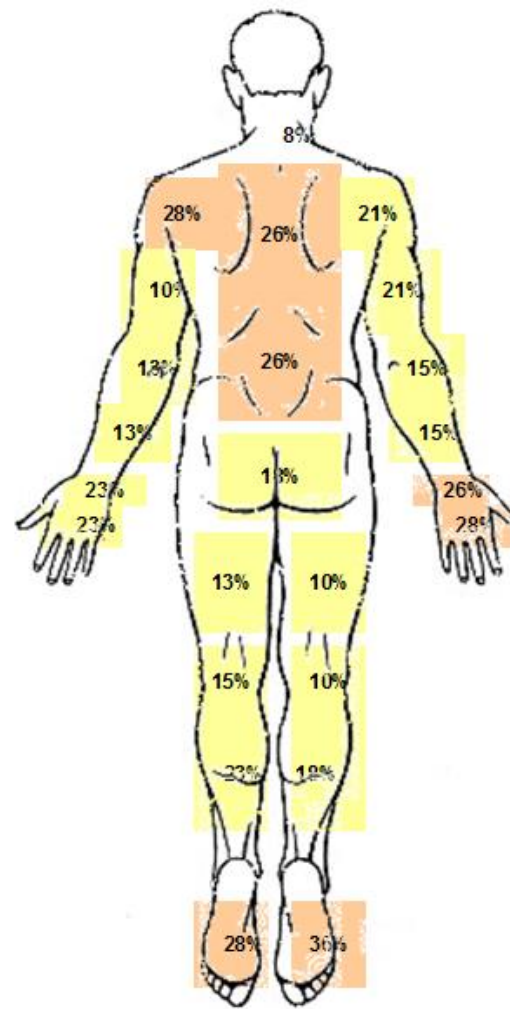


# Department X (N=39)

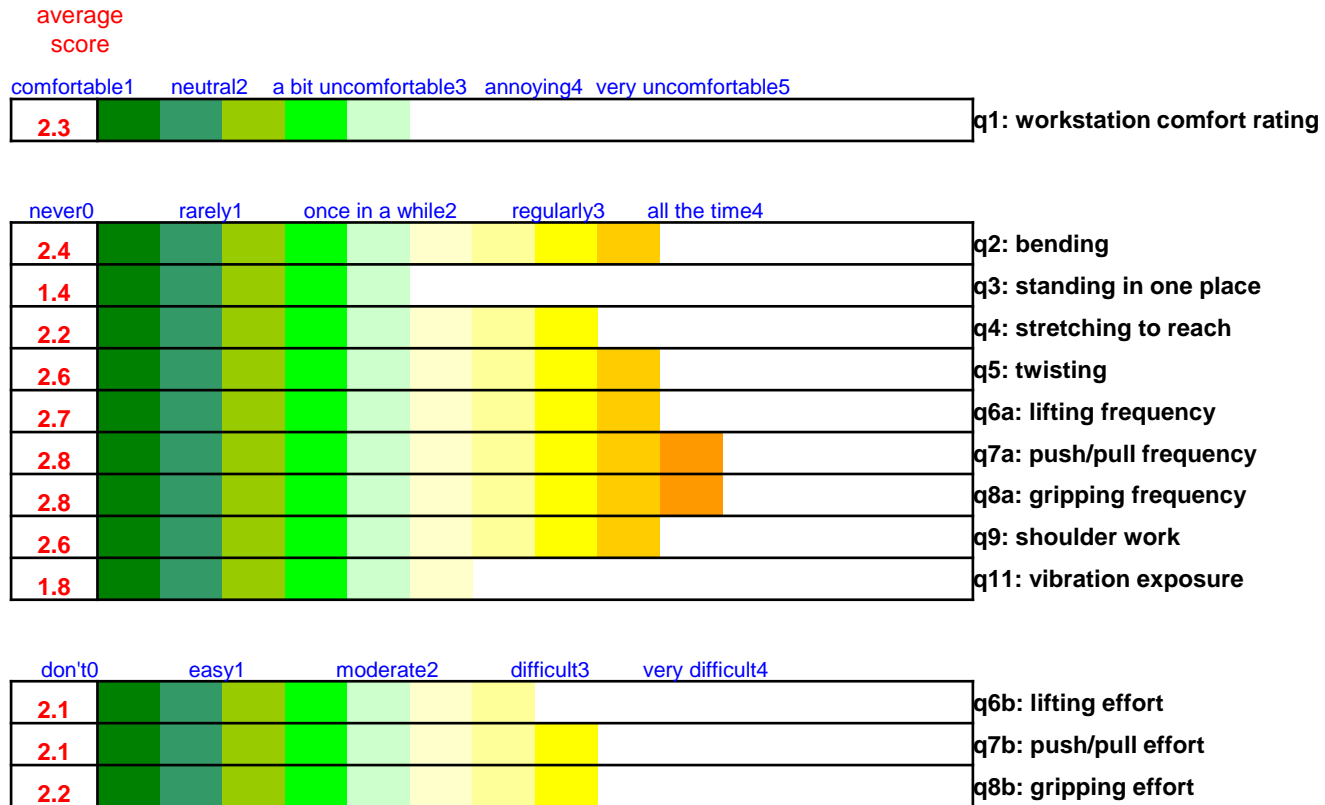
% Somewhat or Very Likely to seek medical treatment



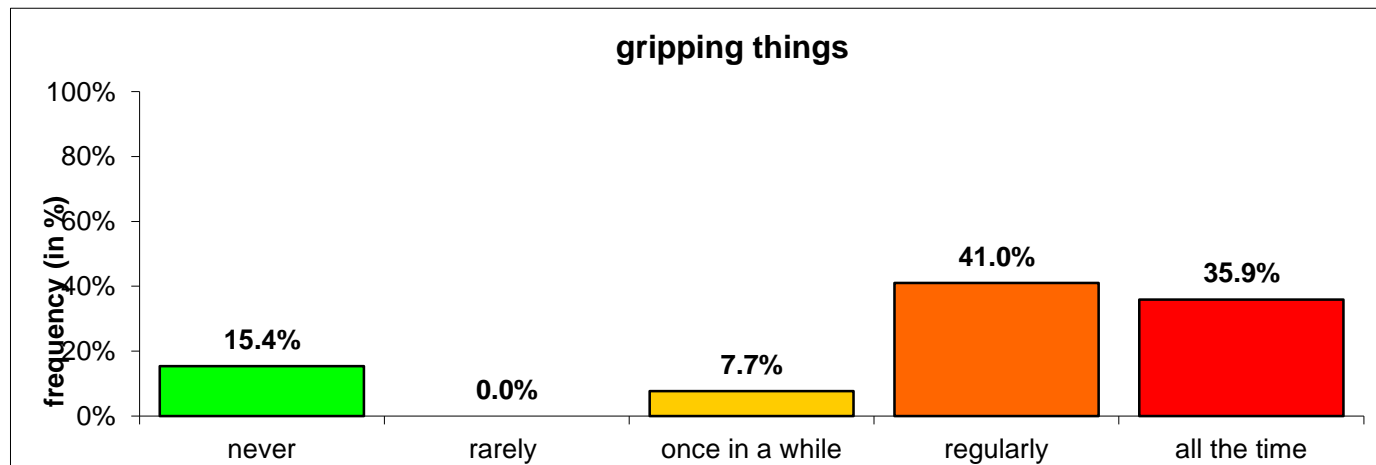
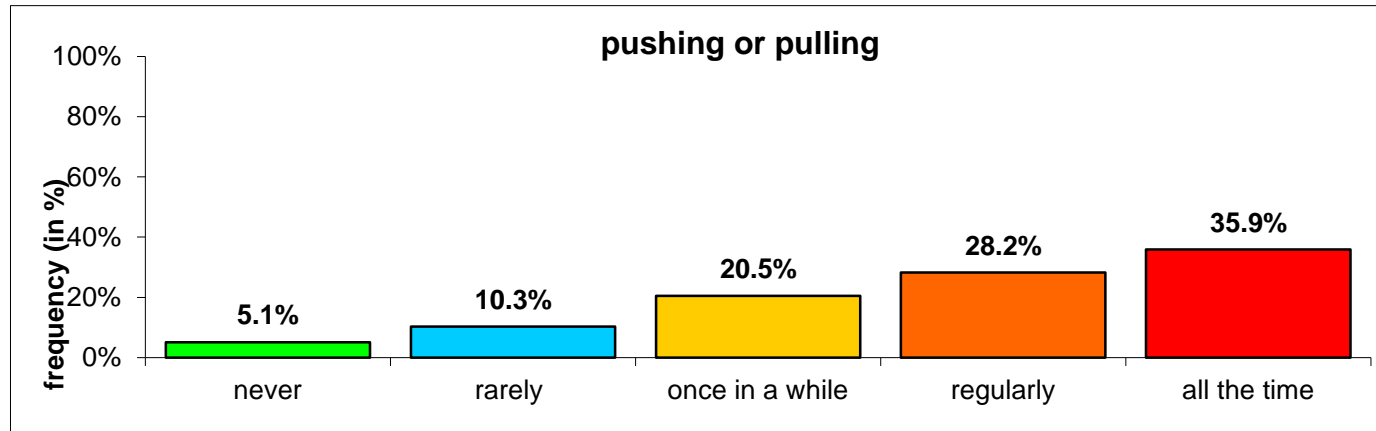
% Very Likely to seek medical treatment



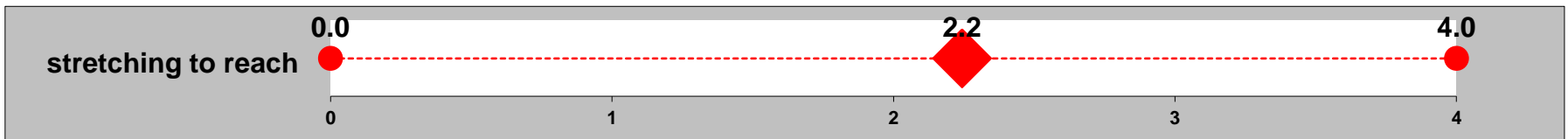
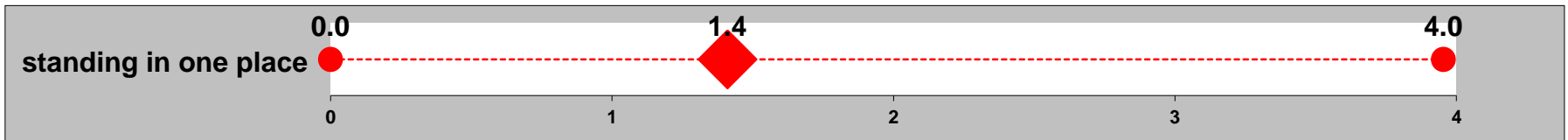
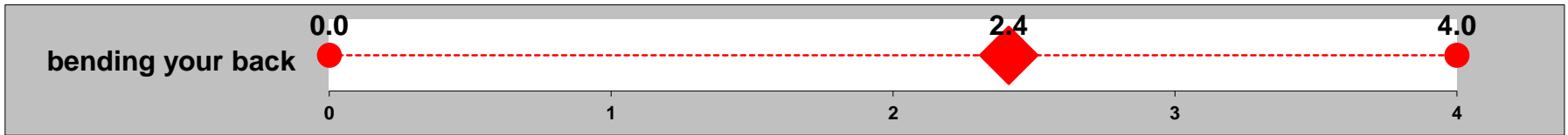
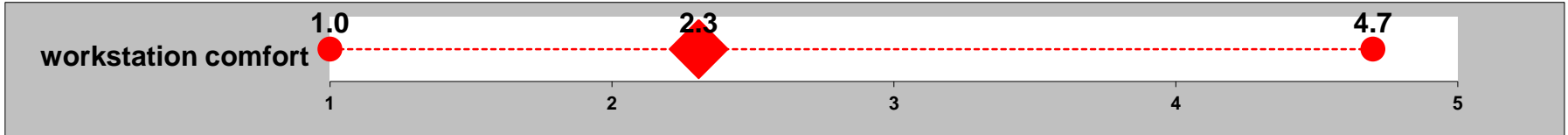
# Department X (N=39)



# Department X (N=39)



# Department X (N=39)





# DESIGN OF THE APP



# The Goal

- For individuals
- Desire to raise awareness about work-related pain and take action to prevent it
- Recommend steps a user can take to change their workplace exposures
- Still finalizing design and content



# User Testing



# PROTOTYPE SNEAK PEAK

