



Ergonomics Risk Factors among Hairdressers Working in India: A Case Study

Appendix I

REBA Employee Assessment Worksheet

Task Name: Hair washing
 Date:

A. Neck, Trunk and Leg Analysis

Step 1: Locate Neck Position

Step 1a: Adjust...
If neck is twisted: +1
If neck is side bending: +1

2+1=3
Neck Score

Step 2: Locate Trunk Position

Step 2a: Adjust...
If trunk is twisted: +1
If trunk is side bending: +1

2+1=3
Trunk Score

Step 3: Legs

Adjust: 30-60° Add +1, >60° Add +2

2
Leg Score

Step 4: Look-up Posture Score in Table A

Using values from steps 1-3 above, Locate score in Table A

6
Posture Score A

Step 5: Add Force/Load Score

If load < 11 lbs.: +0
If load 11 to 22 lbs.: +1
If load > 22 lbs.: +2
Adjust: If shock or rapid build up of force: add +1

0
Force / Load Score

Step 6: Score A, Find Row in Table C

Add values from steps 4 & 5 to obtain Score A. Find Row in Table C.

6
Score A

Scoring
1 = Negligible Risk
2-3 = Low Risk. Change may be needed.
4-7 = Medium Risk. Further Investigate. Change Soon.
8-10 = High Risk. Investigate and Implement Change
11+ = Very High Risk. Implement Change

Scores

Table A		Neck											
		1			2			3					
Legs		1	2	3	4	1	2	3	4	1	2	3	4
Trunk	1	1	2	3	4	1	2	3	4	3	3	5	6
Posture	2	2	3	4	5	3	4	5	6	4	5	6	7
Score	3	2	4	5	6	4	5	6	7	5	6	7	8
	4	3	5	6	7	5	6	7	8	6	7	8	9
	5	4	6	7	8	6	7	8	9	7	8	9	9

Table B		Lower Arm					
		1			2		
Wrist		1	2	3	1	2	3
Upper Arm Score	1	1	2	2	1	2	3
	2	1	2	3	2	3	4
	3	3	4	5	4	5	5
	4	4	5	5	5	6	7
	5	6	7	8	7	8	8
	6	7	8	8	8	9	9

Score A	Table C													
	Score B													
1	1	1	1	2	3	4	5	6	7	8	9	10	11	12
2	1	2	2	3	4	4	5	6	6	7	7	8	8	8
3	2	3	3	4	5	6	7	7	7	8	8	8	8	8
4	3	4	4	5	6	7	8	8	8	9	9	9	9	9
5	4	4	5	6	7	8	8	9	9	9	9	9	9	9
6	6	6	6	7	8	8	9	9	10	10	10	10	10	10
7	7	7	7	8	9	9	9	10	10	11	11	11	11	11
8	8	8	8	9	10	10	10	10	10	11	11	11	11	11
9	9	9	9	10	10	10	11	11	11	11	12	12	12	12
10	10	10	10	11	11	11	11	12	12	12	12	12	12	12
11	11	11	11	11	12	12	12	12	12	12	12	12	12	12
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12

9 + 2 = 11

Table C Score Activity Score REBA Score

B. Arm and Wrist Analysis

Step 7: Locate Upper Arm Position:

Step 7a: Adjust...
If shoulder is raised: +1
If upper arm is abducted: +1
If arm is supported or person is leaning: -1

3+1=4
Upper Arm Score

Step 8: Locate Lower Arm Position:

2
Lower Arm Score

Step 9: Locate Wrist Position:

Step 9a: Adjust...
If wrist is bent from midline or twisted: Add +1

2+1=3
Wrist Score

Step 10: Look-up Posture Score in Table B

Using values from steps 7-9 above, locate score in Table B

7
Posture Score B

Step 11: Add Coupling Score

Well fitting Handle and mid rang power grip, **good: +0**
Acceptable but not ideal hand hold or coupling acceptable with another body part, **fair: +1**
Hand hold not acceptable but possible, **poor: +2**
No handles, awkward, unsafe with any body part, **Unacceptable: +3**

1
Coupling Score

Step 12: Score B, Find Column in Table C

Add values from steps 10 & 11 to obtain Score B. Find column in Table C and match with Score A in row from step 6 to obtain Table C Score.

8
Score B

Step 13: Activity Score

+1 1 or more body parts are held for longer than 1 minute (static)
+1 Repeated small range actions (more than 4x per minute)
+1 Action causes rapid large range changes in postures or unstable base

Original Worksheet Developed by Dr. Alan Hedge. Based on Technical note: Rapid Entire Body Assessment (REBA), Hignett, McAtamney, Applied Ergonomics 31 (2000) 201-205

Appendix II

RULA Employee Assessment Worksheet

Task Name: Hair washing Date: _____

A. Arm and Wrist Analysis

Step 1: Locate Upper Arm Position:

Step 1a: Adjust...
 If shoulder is raised: +1
 If upper arm is abducted: +1
 If arm is supported or person is leaning: -1

3+1=4
Upper Arm Score

Step 2: Locate Lower Arm Position:

Step 2a: Adjust...
 If either arm is working across midline or out to side of body: Add +1

1+1=2
Lower Arm Score

Step 3: Locate Wrist Position:

Step 3a: Adjust...
 If wrist is bent from midline: Add +1

2
Wrist Twist Score

Step 4: Wrist Twist:
 If wrist is twisted in mid-range: +1
 If wrist is at or near end of range: +2

3+1=4
Wrist Score

Step 5: Look-up Posture Score in Table A:
 Using values from steps 1-4 above, locate score in Table A

5
Posture Score A

Step 6: Add Muscle Use Score
 If posture mainly static (i.e. held >10 minutes),
 Or if action repeated occurs 4X per minute: +1

1
Muscle Use Score

Step 7: Add Force/Load Score
 If load < .4.4 lbs. (intermittent): +0
 If load 4.4 to 22 lbs. (intermittent): +1
 If load 4.4 to 22 lbs. (static or repeated): +2
 If more than 22 lbs. or repeated or shocks: +3

0
Force / Load Score

Step 8: Find Row in Table C
 Add values from steps 5-7 to obtain Wrist and Arm Score. Find row in Table C.

6
Wrist & Arm Score

Scores

Table A		Wrist Score						
		1	2	3	4			
Upper Arm	Lower Arm	Wrist Twist	Wrist Twist	Wrist Twist	Wrist Twist			
		1	2	1	2	1	2	
1	1	1	2	2	2	3	3	
	2	2	2	2	2	3	3	
	3	2	3	3	3	3	4	
	1	2	3	3	3	4	4	
	2	2	3	3	3	4	4	
	3	3	4	4	4	4	5	
2	1	3	4	4	4	5	5	
	2	3	3	3	3	4	4	
	3	3	4	4	4	4	5	
	1	3	4	4	4	4	5	
	2	3	4	4	4	4	5	
	3	4	4	4	4	4	5	
3	1	4	4	4	4	5	5	
	2	4	4	4	4	5	5	
	3	4	4	4	4	5	5	
	1	4	4	4	4	5	5	
	2	4	4	4	4	5	5	
	3	4	4	4	4	5	5	
4	1	5	5	5	5	6	6	
	2	5	6	6	6	6	7	
	3	6	6	6	6	7	7	
	1	7	7	7	7	8	8	
	2	8	8	8	8	9	9	
	3	9	9	9	9	9	9	
Table C		Neck, Trunk, Leg Score						
		1	2	3	4	5	6	7+
Wrist / Arm Score	1	1	2	3	3	4	5	5
	2	2	2	3	4	4	5	5
	3	3	3	3	4	4	5	6
	4	3	3	3	4	5	6	6
	5	4	4	4	5	6	7	7
	6	4	4	5	6	6	7	7
	7	5	5	6	6	7	7	7
	8+	5	5	6	7	7	7	7

Scoring: (final score from Table C)
 1-2 = acceptable posture
 3-4 = further investigation, change may be needed
 5-6 = further investigation, change soon
 7 = investigate and implement change

7
RULA Score

B. Neck, Trunk and Leg Analysis

Step 9: Locate Neck Position:

Step 9a: Adjust...
 If neck is twisted: +1
 If neck is side bending: +1

3+1=4
Neck Score

Step 10: Locate Trunk Position:

Step 10a: Adjust...
 If trunk is twisted: +1
 If trunk is side bending: +1

2+1=3
Trunk Score

Step 11: Legs:
 If legs and feet are supported: +1
 If not: +2

2
Leg Score

Step 12: Look-up Posture Score in Table B:
 Using values from steps 9-11 above, locate score in Table B

Neck Posture Score	Table B: Trunk Posture Score					
	1	2	3	4	5	6
1	1	2	3	3	4	5
2	2	3	3	4	5	5
3	3	3	4	4	5	6
4	5	5	6	6	7	7
5	7	7	7	8	8	8
6	8	8	8	8	9	9

7
Posture B Score

Step 13: Add Muscle Use Score
 If posture mainly static (i.e. held >10 minutes),
 Or if action repeated occurs 4X per minute: +1

1
Muscle Use Score

Step 14: Add Force/Load Score
 If load < .4.4 lbs. (intermittent): +0
 If load 4.4 to 22 lbs. (intermittent): +1
 If load 4.4 to 22 lbs. (static or repeated): +2
 If more than 22 lbs. or repeated or shocks: +3

0
Force / Load Score

Step 15: Find Column in Table C
 Add values from steps 12-14 to obtain Neck, Trunk and Leg Score. Find Column in Table C.

8
Neck, Trunk, Leg Score

Original Worksheet Developed by Dr. Alan Hedge. Based on RULA: a survey method for the investigation of work-related upper limb disorders, McAtamney & Corlett, Applied Ergonomics 1993, 24(2), 91-99

Appendix III

ERGONOMICS PLUS

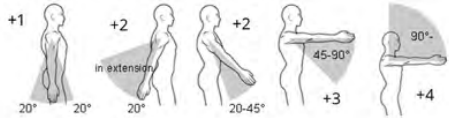
RULA Employee Assessment Worksheet

Task Name: Haircutting

Date:

A. Arm and Wrist Analysis

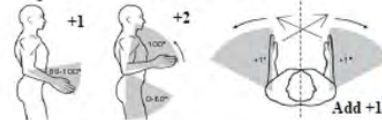
Step 1: Locate Upper Arm Position:



Step 1a: Adjust...
 If shoulder is raised: +1
 If upper arm is abducted: +1
 If arm is supported or person is leaning: -1

3+1=4
Upper Arm Score

Step 2: Locate Lower Arm Position:



Step 2a: Adjust...
 If either arm is working across midline or out to side of body: Add +1

2+1=3
Lower Arm Score

Step 3: Locate Wrist Position:



Step 3a: Adjust...
 If wrist is bent from midline: Add +1

Step 4: Wrist Twist:

If wrist is twisted in mid-range: +1
 If wrist is at or near end of range: +2

2 Wrist Twist Score
3+1=4 Wrist Score

Step 5: Look-up Posture Score in Table A:

Using values from steps 1-4 above, locate score in Table A

6 Posture Score A

Step 6: Add Muscle Use Score

If posture mainly static (i.e. held >10 minutes),
 Or if action repeated occurs 4X per minute: +1

2 Muscle Use Score

Step 7: Add Force/Load Score

If load < 4.4 lbs. (intermittent): +0
 If load 4.4 to 22 lbs. (intermittent): +1
 If load 4.4 to 22 lbs. (static or repeated): +2
 If more than 22 lbs. or repeated or shocks: +3

0 Force / Load Score

Step 8: Find Row in Table C

Add values from steps 5-7 to obtain Wrist and Arm Score. Find row in Table C.

8 Wrist & Arm Score

Scores

Table A		Wrist Score			
Upper Arm	Lower Arm	Wrist Twist 1	Wrist Twist 2	Wrist Twist 3	Wrist Twist 4
1	1	2	2	2	2
1	2	2	2	2	3
1	3	2	3	3	3
2	1	2	3	3	3
2	2	2	3	3	3
2	3	2	3	3	3
3	1	2	3	3	3
3	2	2	3	3	3
3	3	2	3	3	3
4	1	2	3	3	3
4	2	2	3	3	3
4	3	2	3	3	3
5	1	2	3	3	3
5	2	2	3	3	3
5	3	2	3	3	3
6	1	2	3	3	3
6	2	2	3	3	3
6	3	2	3	3	3

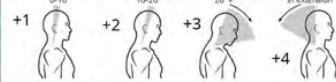
Table C		Neck, Trunk, Leg Score						
Wrist / Arm Score	Neck, Trunk, Leg Score	1	2	3	4	5	6	7+
1	1	2	3	3	4	5	5	5
2	2	2	3	4	4	5	5	5
3	3	3	3	4	4	5	5	5
4	3	3	3	4	5	6	6	6
5	4	4	4	5	6	7	7	7
6	4	4	5	6	6	7	7	7
7	5	5	6	6	7	7	7	7
8+	5	5	6	7	7	7	7	7

Scoring: (final score from Table C)
 1-2 = acceptable posture
 3-4 = further investigation, change may be needed
 5-6 = further investigation, change soon
 7 = investigate and implement change

7 RULA Score

B. Neck, Trunk and Leg Analysis

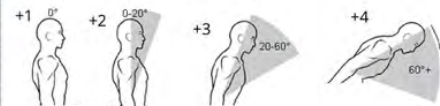
Step 9: Locate Neck Position:



Step 9a: Adjust...
 If neck is twisted: +1
 If neck is side bending: +1

4+1=5
Neck Score

Step 10: Locate Trunk Position:



Step 10a: Adjust...
 If trunk is twisted: +1
 If trunk is side bending: +1

1+1=2
Trunk Score

Step 11: Legs:

If legs and feet are supported: +1
 If not: +2

2 Leg Score

Neck Posture Score	Table B: Trunk Posture Score					
	Legs 1	Legs 2	Legs 3	Legs 4	Legs 5	Legs 6
1	1	2	2	2	2	2
2	2	3	3	4	5	5
3	3	3	4	4	5	5
4	5	5	5	6	6	6
5	7	7	7	7	8	8
6	8	8	8	8	8	8

Step 12: Look-up Posture Score in Table B:

Using values from steps 9-11 above, locate score in Table B

7 Posture B Score

Step 13: Add Muscle Use Score

If posture mainly static (i.e. held >10 minutes),
 Or if action repeated occurs 4X per minute: +1

1 Muscle Use Score

Step 14: Add Force/Load Score

If load < 4.4 lbs. (intermittent): +0
 If load 4.4 to 22 lbs. (intermittent): +1
 If load 4.4 to 22 lbs. (static or repeated): +2
 If more than 22 lbs. or repeated or shocks: +3

0 Force / Load Score

Step 15: Find Column in Table C

Add values from steps 12-14 to obtain Neck, Trunk and Leg Score. Find Column in Table C.

8 Neck, Trunk, Leg Score

Original Worksheet Developed by Dr. Alan Hedge. Based on RULA: a survey method for the investigation of work-related upper limb disorders, McAtamney & Corlett, Applied Ergonomics 1993, 24(2), 91-99

Appendix IV

REBA Employee Assessment Worksheet

Task Name: Haircutting Date: _____

A. Neck, Trunk and Leg Analysis

Step 1: Locate Neck Position

 Step 1a: Adjust...
 If neck is twisted: +1
 If neck is side bending: +1
Neck Score: 2+1=3

Step 2: Locate Trunk Position

 Step 2a: Adjust...
 If trunk is twisted: +1
 If trunk is side bending: +1
Trunk Score: 2+1=3

Step 3: Legs

Leg Score: 2

Step 4: Look-up Posture Score in Table A
 Using values from steps 1-3 above, Locate score in Table A
Posture Score A: 6

Step 5: Add Force/Load Score
 If load < 11 lbs.: +0
 If load 11 to 22 lbs.: +1
 If load > 22 lbs.: +2
 Adjust: If shock or rapid build up of force: add +1
Force / Load Score: 0

Step 6: Score A, Find Row in Table C
 Add values from steps 4 & 5 to obtain Score A. Find Row in Table C.
Score A: 6

Scoring
 1 = Negligible Risk
 2-3 = Low Risk. Change may be needed.
 4-7 = Medium Risk. Further Investigate. Change Soon.
 8-10 = High Risk. Investigate and Implement Change
 11+ = Very High Risk. Implement Change

Scores

Table A		Neck											
		1			2			3			4		
Legs		1	2	3	4	1	2	3	4	1	2	3	4
Trunk		1	2	3	4	1	2	3	4	3	3	5	6
Posture		2	3	4	5	3	4	5	6	7	5	6	7
Score		4	3	5	6	7	5	6	7	8	6	7	8
		5	4	6	7	8	6	7	8	9	7	8	9

Table B		Lower Arm					
		1			2		
Wrist		1	2	3	1	2	3
Upper Arm		2	1	2	3	2	3
Score		3	3	4	5	4	5
		4	4	5	5	6	7
		5	6	7	8	7	8
		6	7	8	8	9	9

Score A	Table C													
	Score B													
1	1	1	1	2	3	4	5	6	7	8	9	10	11	12
2	1	2	2	3	4	4	5	6	6	7	7	8	8	8
3	2	3	3	3	4	5	6	7	7	7	8	8	8	8
4	3	4	4	4	5	6	7	8	8	9	9	9	9	9
5	4	4	4	5	6	7	8	8	9	9	9	9	9	9
6	6	6	6	7	8	8	9	9	10	10	10	10	10	10
7	7	7	7	8	9	9	9	10	10	10	11	11	11	11
8	8	8	8	9	10	10	10	10	10	10	11	11	11	11
9	9	9	9	10	10	10	10	10	10	10	11	11	11	11
10	10	10	10	10	10	10	10	10	10	10	11	11	11	11
11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12

10 + 2 = 12

Table C Score Activity Score REBA Score

B. Arm and Wrist Analysis

Step 7: Locate Upper Arm Position:

 Step 7a: Adjust...
 If shoulder is raised: +1
 If upper arm is abducted: +1
 If arm is supported or person is leaning: -1
Upper Arm Score: 3+1=4

Step 8: Locate Lower Arm Position:

Lower Arm Score: 2

Step 9: Locate Wrist Position:

 Step 9a: Adjust...
 If wrist is bent from midline or twisted: Add +1
Wrist Score: 2+1=3

Step 10: Look-up Posture Score in Table B
 Using values from steps 7-9 above, locate score in Table B
Posture Score B: 7

Step 11: Add Coupling Score
 Well fitting Handle and mid rang power grip, **good: +0**
 Acceptable but not ideal hand hold or coupling acceptable with another body part, **fair: +1**
 Hand hold not acceptable but possible, **poor: +2**
 No handles, awkward, unsafe with any body part, **Unacceptable: +3**
Coupling Score: 2

Step 12: Score B, Find Column in Table C
 Add values from steps 10 & 11 to obtain Score B. Find column in Table C and match with Score A in row from step 6 to obtain Table C Score.
Score B: 9

Step 13: Activity Score
 +1 1 or more body parts are held for longer than 1 minute (static)
 +1 Repeated small range actions (more than 4x per minute)
 +1 Action causes rapid large range changes in postures or unstable base

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