

# Promoting Practitioner Wellness in the Neurotology Clinic – An Ergonomic Assessment of the Dix-Hallpike’s Test.

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## Abstract

**Objectives:** Numerous tasks carried out in the otolaryngology clinic increase the chances of developing injury among practitioners. To mitigate this, we aim to observe the risk of musculoskeletal injury in practitioners when carrying out common procedures. We observe the performance of the Dix-Hallpike manoeuvre, deducing whether technique has an impact on the likelihood of developing injury. **Design:** Participants were asked to perform the Dix-Hallpike manoeuvre as they normally would in clinic, on departmental colleagues. Data that was collected included chosen preference of position when carrying out manoeuvre, level of seniority of practitioner and risk of musculoskeletal injury to practitioner. **Setting:** Simulated outpatient department; St John’s Hospital, Edinburgh. **Participants:** Otolaryngology consultants and trainees with clinic commitments, having regularly performed the Dix-Hallpike manoeuvre. **Main outcome measures:** Risk of musculoskeletal injury was measured using the validated Rapid Upper Limb Assessment (RULA) tool. **Results:** 3 consultants and 7 trainees were included in this study performing on average 4 Dix-Hallpike’s during the study period – totalling 40 attempts. The median RULA score was 4 for the sitting position, compared to 6 for standing ( $p < 0.0001$ ). There was similar statistical significance when consultants and trainees were evaluated separately. **Conclusions:** A doctor’s wellness is of great importance to facilitate long-term job satisfaction and productivity. It is important to improve conditions for the practitioner in the otology clinic, and one factor is procedural technique. Further work is needed to raise ergonomic awareness amongst otolaryngology surgeons.

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**RULA Employee Assessment Worksheet**

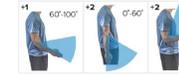
Task Name: \_\_\_\_\_ Date: \_\_\_\_\_

**A. Arm and Wrist Analysis**

**Step 1: Locate Upper Arm Position:**  +1 0°-30° +2 30°-45° +3 45°-60° +4 60°-90°

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

Upper Arm Score:

**Step 2: Locate Lower Arm Position:**  +1 0°-30° +2 30°-60° +3 60°-90° +4 90°-100°

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

Lower Arm Score:

**Step 3: Locate Wrist Position:**  +1 0°-15° +2 15°-30° +3 30°-45° +4 45°-60°

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

Wrist Score:

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

Wrist Twist Score:

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

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

Posture Score A:

**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

Muscle Use Score:

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.

Wrist & Arm Score:

**B. Neck, Trunk and Leg Analysis**

**Step 9: Locate Neck Position:**  +1 0°-10° +2 10°-20° +3 20°-30° +4 30° or extension

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

Neck Score:

**Step 10: Locate Trunk Position:**  +1 0°-10° +2 10°-20° +3 20°-30° +4 30°

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

Trunk Score:

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

Leg Score:

**Table A: Wrist Score**

Upper Arm	Lower Arm	Wrist Twist	Wrist Twist	Wrist Twist	Wrist Twist	
1	1	2	2	2	3	3
1	2	2	2	2	3	3
1	3	2	3	3	3	4
2	1	2	3	3	3	4
2	2	3	3	3	3	4
2	3	3	4	4	4	5
3	1	3	4	4	4	5
3	2	3	4	4	4	5
3	3	4	4	4	4	5
4	1	4	4	4	4	5
4	2	4	4	4	4	5
4	3	4	4	5	5	6
5	1	5	5	5	5	6
5	2	5	6	6	6	7
5	3	6	6	7	7	8
6	1	7	7	7	7	8
6	2	8	8	8	8	9
6	3	9	9	9	9	9

**Table B: Trunk Posture Score**

Neck Posture Score	Legs	Legs	Legs	Legs	Legs	
1	1	2	3	4	5	6
2	1	2	3	4	5	6
3	1	2	3	4	5	6
4	1	2	3	4	5	6
5	1	2	3	4	5	6
6	1	2	3	4	5	6

**Table C: Neck, Trunk, Leg Score**

Neck, Trunk, Leg Score					
1	1	2	3	4	5
2	2	3	4	5	6
3	3	4	5	6	7
4	4	5	6	7	8
5	5	6	7	8	9
6	6	7	8	9	9
7	7	8	9	9	9
8	8	9	9	9	9

**Table D: Wrist / Arm Score**

| Wrist / Arm Score |
|-------------------|-------------------|-------------------|-------------------|-------------------|
| 1                 | 1                 | 2                 | 3                 | 4                 |
| 2                 | 2                 | 3                 | 4                 | 5                 |
| 3                 | 3                 | 4                 | 5                 | 6                 |
| 4                 | 4                 | 5                 | 6                 | 7                 |
| 5                 | 5                 | 6                 | 7                 | 8                 |
| 6                 | 6                 | 7                 | 8                 | 9                 |
| 7                 | 7                 | 8                 | 9                 | 9                 |
| 8                 | 8                 | 9                 | 9                 | 9                 |

**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

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

Posture B Score:

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

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.

Neck, Trunk, Leg Score:

**RULA Score**

based on RULA: a survey method for the investigation of work-related upper limb disorders, McAtamney & Corlett, Applied Ergonomics 1993, 24(2), 91-99



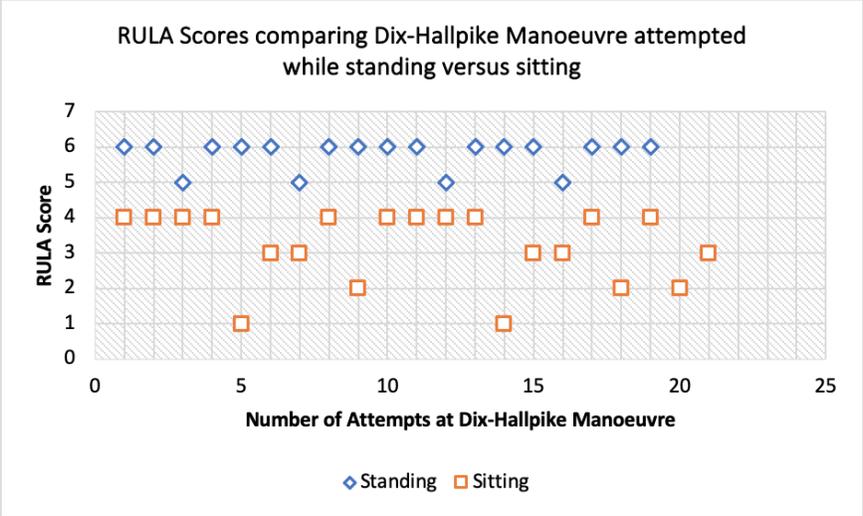
Figure 2a



Figure 2b

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Table 2.docx available at <https://authorea.com/users/470084/articles/562481-promoting-practitioner-wellness-in-the-neurotology-clinic-an-ergonomic-assessment-of-the-dix-hallpike-s-test>

