

# **BROM Basic Procedure Manual**

## **Procedure for Measuring Back Motion with the BROM Basic**

**BROM (Back Range of Motion Instrument)**

**is a product of:**

**Performance Attainment Associates**

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## Introduction

The BROM Basic includes the **BROM R/L (Back Range of Motion/Lateral Flexion)** unit which measures Rotation and Lateral Flexion of the lumbar and thoracic spine. The meter unit has an inclinometer for Lateral Flexion measurements and a magnetic inclinometer (compass) for rotation measurements. The BROM R/L provides readings that can easily be produced by a second examiner.

The BROM Basic also features two **Universal Inclinometers** which can be used to measure Flexion and Extension of the spine and range of motion of the extremities. The Universal Inclinometer has two interchangeable bases. The rubber footed base is ideal for measurements of a curved surface such as the spine. The long arm of the Universal Inclinometer is ideal for longer bones, such as the arm and leg, for measurement of the elbows, wrists, and knees.

This procedure provides standardized protocol for four types of measurements.

Rotation Measurements

Lateral Flexion Measurements

Flexion Measurements

Extension Measurements

There are two Appendices that provide supporting information.

Appendix A – Recording Sheet

Appendix B – Warranty

**IMPORTANT:** Accurate measurements of the lumbar and thoracic spine require that all contacts are on the skin (to prevent slippage of the instruments).

## ROTATION MEASUREMENTS

The compass on the BROM R/L Unit measures to the magnetic reference placed on a selected spine location thus eliminating unwanted spine movement below that point. An added advantage of this method is that measurements are made with the trunk in the vertical position. The BROM R/L Unit is designed so when the examiner grasps the rib cage the unit becomes an integral part of the patient, thus eliminating tracking errors.

- 1) Palpate and mark S1 and T12  
(see figure 1).



Figure 1: Palpation Markings

- 2) Place the belt between S1 and T12 with the Velcro side out. Place the magnetic reference over the sacrum (approximately 4 cm below S1) and attach the Velcro straps (see figure 2).



Figure 2: Belt/magnetic reference placement

- 3) Have the patient sit erect on a non-rotating stool facing west. The arrow on the magnetic reference should point north (see figure 3). Feet should be flat on the floor. This position will stabilize the pelvic area. The patient's arms should be crossed over the chest with hands placed on the shoulders.



Figure 3: Sitting Position

- 4) Demonstrate and have the patient do rotation movements. Emphasize the importance of smooth steady movements that go to end range.
- 5) Place the BROM R/L Unit so the unit's feet are in line with T12. Hold the center of the unit firmly against the patient's back and zero the compass. Place the thumbs on the unit and the fingers over the rib cage (see figure 4). Check that the reading on the compass is still zero.
- 6) Have the patient slowly turn the shoulders to the right making sure they go to full range (see figure 5). Record the reading (typical value is 10 degrees).
- 7) Have the patient slowly turn the shoulders to the left making sure they go to full range (see figure 6). Record the reading (typical value is 10 degrees).
- 8) Repeat steps 5 through 7. If readings are within 2 degrees of the respective readings record the higher reading. If not repeat steps 5 through 7.



Figure 4: BROM R/L positioning



Figure 5: Right rotation



Figure 6: Left rotation

Thoracic/lumbar rotation can be measured by leaving the magnetic reference on the scrum and placing the BROM R/L Unit at T1. To measure only thoracic rotation the belt should be moved so the magnetic reference can be placed on T12 and the BROM R/L Unit should be placed at T1 (typical value is 30 degrees).

## LUMBAR LATERAL FLEXION MEASUREMENTS

The BROM R/L Unit is designed so when the examiner grasps the rib cage the unit becomes an integral part of the patient, thus eliminating tracking errors.

- 1) Demonstrate and have the patient do lateral flexion movements. Emphasize the importance of smooth steady movements that go to end range.
- 2) Have the patient stand erect with nose nearly touching the wall. This position will keep the patient from bending forward during lateral flexion measurements.
- 3) Place the BROM R/L Unit so the unit's feet are in line with T12. Place the thumbs over the back of the unit's feet and grasp the rib cage with the fingers. Adjust the unit's position on the back until the inclinometer reads zero (see figure 7).
- 4) For right lateral flexion have the patient slide their right hand down the side of their leg with the body weight shifted to the left foot and keeping the legs straight (see figure 8). Record the reading (typical value is 25 degrees).



Figure 7: Lateral flexion measurements



Figure 8: Right lateral flexion

- 5) For left lateral flexion have the patient slide the left hand down the outer side of the leg with the body weight shifted to the right foot and keeping both legs straight (see figure 9). Record the reading (typical value is 25 degrees).
- 6) Repeat steps 3 through 5. If readings are within 2 degrees of the respective readings record the higher reading. If not repeat steps 3 through 5.



Figure 9: Left lateral flexion



## FLEXION/EXTENSION MEASUREMENTS

Use the two Universal Inclinometers to make flexion/extension measurements. Measurements with the Universal Inclinometer need to be with the patient in an upright position.

- 1) Palpate and mark S1 and T12. Mark on bare skin when possible. This avoids the marks moving with the patient's clothing.
- 2) Center the two inclinometers over the palpation marks and zero with your finger by spinning the dial (zero would then be at the bottom of the inclinometer).
- 3) Have the patient flex forward as far as possible (see figure 10). Note the reading on each inclinometer.



Figure 10: Lumbar flexion measurement

- 4) The reading on the upper inclinometer is TOTAL lumbar flexion. The reading on the lower inclinometer is SACRAL flexion. The difference between the reading at S1 and T12 is TRUE lumbar flexion. In most cases true lumbar flexion is the reading that is needed (a typical value is 60 degrees).
- 5) Repeat flexion protocol for extension having the patient extend back for full extension instead of flexing forward. Record the value.



Figure 11: Wrist rotation

The thoracic spine can be measured using the same process but different reference points. Thoracic extension is not usually needed.

To measure wrist rotation use the long arm attachment to the Universal Inclinometer (see figure 11). Other measurements using the long arm are shoulder, elbow and knee.

## APPENDIX A BROM RECORDING SHEET

Name: \_\_\_\_\_ Date of Initial Evaluation \_\_\_\_\_

Facility: \_\_\_\_\_ Examiner: \_\_\_\_\_

|  | TYPICAL<br>VALUE | MEASUREMENT DATE |
|--|------------------|------------------|
|--|------------------|------------------|

-----

### LUMBAR MEASUREMENTS

|                |    |       |
|----------------|----|-------|
| Right Rotation | 10 | ----- |
|----------------|----|-------|

|               |    |       |
|---------------|----|-------|
| Left Rotation | 10 | ----- |
|---------------|----|-------|

|                       |    |       |
|-----------------------|----|-------|
| Right Lateral Flexion | 25 | ----- |
|-----------------------|----|-------|

|                      |    |       |
|----------------------|----|-------|
| Left Lateral Flexion | 25 | ----- |
|----------------------|----|-------|

|                 |  |       |
|-----------------|--|-------|
| Flexion (Total) |  | ----- |
|-----------------|--|-------|

|                  |  |       |
|------------------|--|-------|
| Flexion (Sacral) |  | ----- |
|------------------|--|-------|

|                |    |       |
|----------------|----|-------|
| Flexion (True) | 60 | ----- |
|----------------|----|-------|

|                   |  |       |
|-------------------|--|-------|
| Extension (Total) |  | ----- |
|-------------------|--|-------|

|                    |  |       |
|--------------------|--|-------|
| Extension (Sacral) |  | ----- |
|--------------------|--|-------|

|                  |    |       |
|------------------|----|-------|
| Extension (True) | 25 | ----- |
|------------------|----|-------|

### THORACIC MEASUREMENTS

|         |    |       |
|---------|----|-------|
| Flexion | 50 | ----- |
|---------|----|-------|

|                |    |       |
|----------------|----|-------|
| Right Rotation | 30 | ----- |
|----------------|----|-------|

|               |    |       |
|---------------|----|-------|
| Left Rotation | 30 | ----- |
|---------------|----|-------|

## APPENDIX B

### LIMITED WARRANTY

The **BROM (Back Range of Motion Instrument)** is warranted for one full year from the date of purchase to be free from defects in materials and workmanship when used in normal operating conditions.

Performance Attainment Associates will repair or replace, at it's option, any part which has been found to be defective and within the warranty period, provided the product is shipped prepaid and insured to Performance Attainment Associates. Call: 651-257-3040 to obtain authorization, shipping address and instructions. The repaired or replaced product under this warranty will be shipped back to the customer prepaid and insured.

Performance Attainment Associates shall not be liable for any special or consequential damages or loss, damage or expense, directly or indirectly arising from the use of the BROM or any inability to use it.