

BROM II Procedure Manual

Procedure for Measuring Back Motion with the BROM II

BROM (Back Range of Motion Instrument)

is a product of:

Performance Attainment Associates

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Introduction

The **BROM II (Back Range of Motion Instrument)** measures range of motion of the lumbar and thoracic spine. The BROM II provides readings that can easily be produced by a second examiner.

This procedure provides standardized protocol for four types of measurements.

Flexion and Extension Measurements

Pelvic Tilt

Rotation Measurements

Lateral Flexion Measurements

There are two Appendices that provide supporting information.

Appendix A – Typical Values

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).

FLEXION /EXTENSION MEASUREMENTS

The Flexion/Extension Unit is a modified inclinometer that eliminates the need to measure sacral flexion. The pointer is part of the base that is placed on the sacrum so all readings are relative to the sacrum. The arm moves the scale with the upper measuring point so that the reading is the range of motion relative to the sacrum. Since only one hand is required for holding the BROM II the second hand is available to assist the patient in reaching maximum flexion. The reading (in centimeters) on the sliding arm scale can be used in future evaluations so the same spine segment will be measured. This assures that the measurements can be easily reproduced by a second examiner.

- 1) For lumbar measurements, palpate and mark S1 and T12 (see figure 1).
- 2) Place the BROM Flexion/Extension unit on the sacrum with the pivot point on S1. Have the patient stretch the Velcro straps across the lower abdomen (see figure 2). Check that both contact points are held firmly against the sacrum. The downward pull of the straps is essential to maintain the contact points against the sacrum during flexion and extension.
- 3) Demonstrate and have patient perform flexion and extension movements. Emphasize the importance of smooth steady movements that go to end range. Check that both contact points remain on the sacrum and the pivot point remains on S1 during movements.



Figure 1: palpate and mark S1 and T12



Figure 2: Flexion/Extension unit placement

- 4) Have the patient stand erect. Feet should be shoulder width apart. Place the moveable arm on T12 and record the reading on the sliding scale. This reading is the distance between S1 and T12 and can be used to position the arm during future measurements to assure that the same segment of spine is measured. The typical reading for an adult is 15 cm.

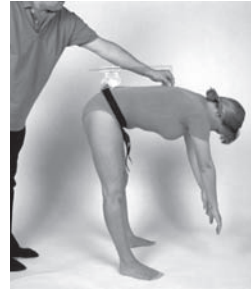


Figure 3: Flexion measurement

- 5) With the arm tip on T12 record the initial reading in degrees from the outer protractor scale. Remove the arm tip from T12 and place a finger securely on T12. Have the patient slowly bend forward trying to lay the palms on the floor. Replace the arm tip on T12 and take the reading.
- 6) Repeat step 5. If the reading is within 3 degrees record the higher reading. If not, repeat.

7) **EXTENSION MEASUREMENTS**

Check that the patient is standing erect. Have the patient put their hands on their shoulders. Place the arm tip on T12 and record the initial reading from the outer scale. Remove the arm tip and have the patient extend backward (see figure 4). Provide the necessary support to prevent the patient from falling backward. Replace the arm tip on T12 and record the full extension reading. Subtract the full extension reading from the initial reading to obtain true flexion. A typical value is 12 degrees.



Figure 4: Extension measurement

8) **PELVIC TILT MEASUREMENT**

Remove the arm. Have the patient stand erect. Move the dial until the yellow vial's bubble is between the two line (see figure 5). Record the reading from the INNER scale.

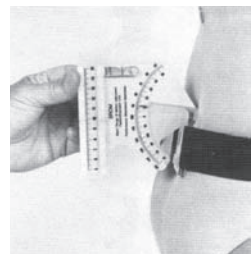


Figure 5: Pelvic Tilt

Thoracic Flexion can be measured by palpating and using T12 and T1

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 6).



Figure 6: 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 7).
- 3) Have the patient sit erect on a non-rotating stool facing west. The arrow on the magnetic reference should point north (see figure 8). 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 7: Belt/magnetic reference placement

- 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 with the fingers grasping the rib cage (see figure 9). 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 10). 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 11). 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 8: Sitting Position



Figure 9: Zero the meter



Figure 10: Right 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).

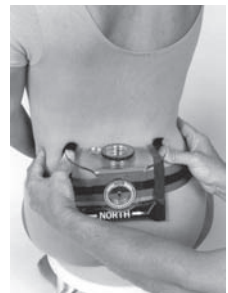


Figure 11: Left rotation

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 12).
- 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 13). Record the reading (typical value is 25 degrees).



Figure 12: Lateral flexion measurements



Figure 13: 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 14). 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 14: Left lateral flexion

APPENDIX A BROM RECORDING SHEET

Name: _____ Date of Initial Evaluation _____

Facility: _____ Examiner: _____

	TYPICAL VALUE	MEASUREMENT DATE
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LUMBAR MEASUREMENTS

Right Rotation	10	_____
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Left Rotation	10	_____
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Right Lateral Flexion	25	_____
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Left Lateral Flexion	25	_____
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Flexion Starting Position		_____
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Full Flexion		_____
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True (double for AMA)	60	_____
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Extension Starting position		_____
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Full Flexion		_____
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True (double for AMA)	25	_____
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THORACIC MEASUREMENTS

Flexion	50	_____
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Right Rotation	30	_____
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Left Rotation	30	_____
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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 its 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.