

# Titronics Range of Motion Hardware & Software Installation

## Step 1 – Titronics ROM Software Installation

Insert the Titronics Flash Drive into a USB port.



Open the Flash Drive and click on **Titronics.exe**

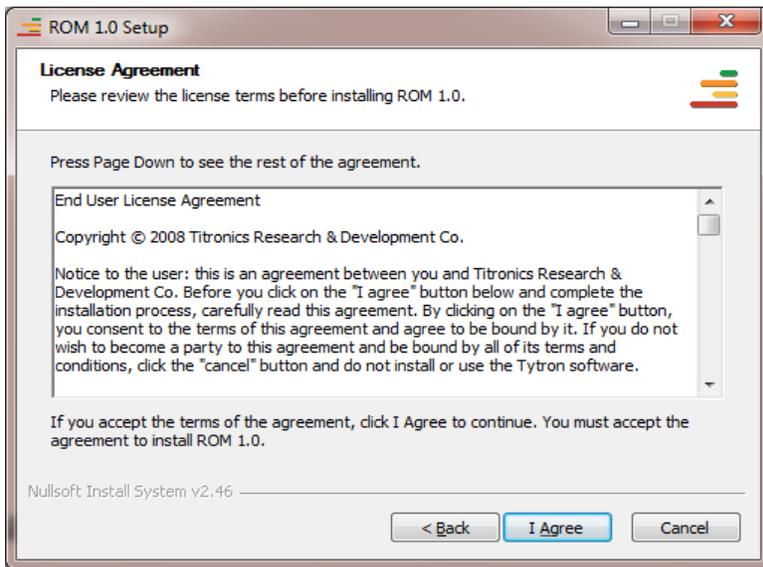
Click **Install ROM Software**.

After clicking **Install ROM Software**, the Setup verifies and loads the installation program.

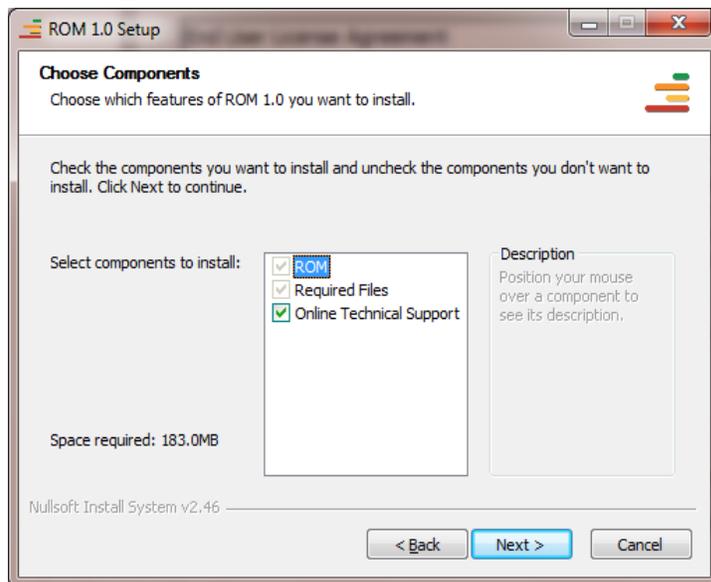
The Setup Wizard appears. Click **Next**.



Read the License Agreement. To accept, click **I Agree**.



The **Choose Components** installation screen appears.

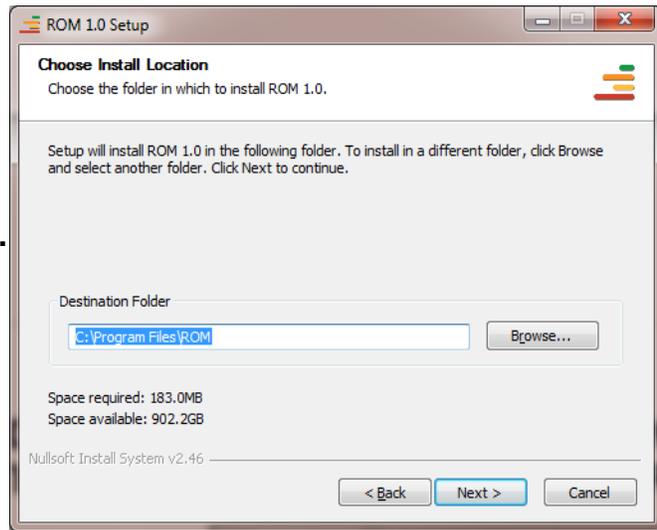


**Titronics ROM** - The Program File (required on first time install).

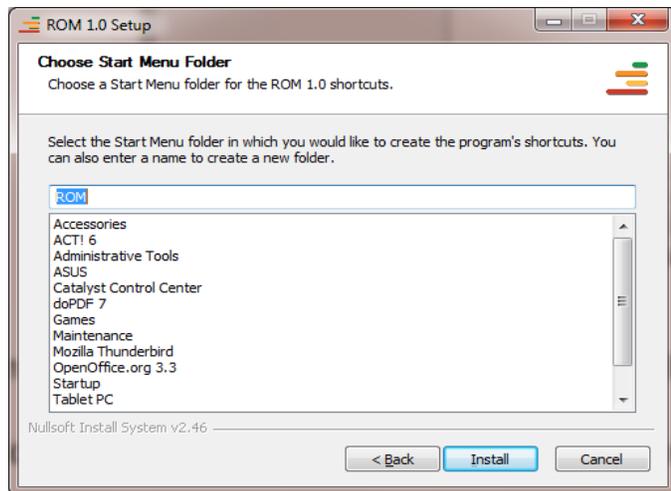
**Required Files** – Additional files required for the software to function properly.

**Online Technical Support** – Installs the Titronics Instant Support program. Clicking this icon on your desktop (after the installation) will connect your computer to one of our online technical support representatives. (Be sure to allow them access to your computer if you are attempting to get technical support.)

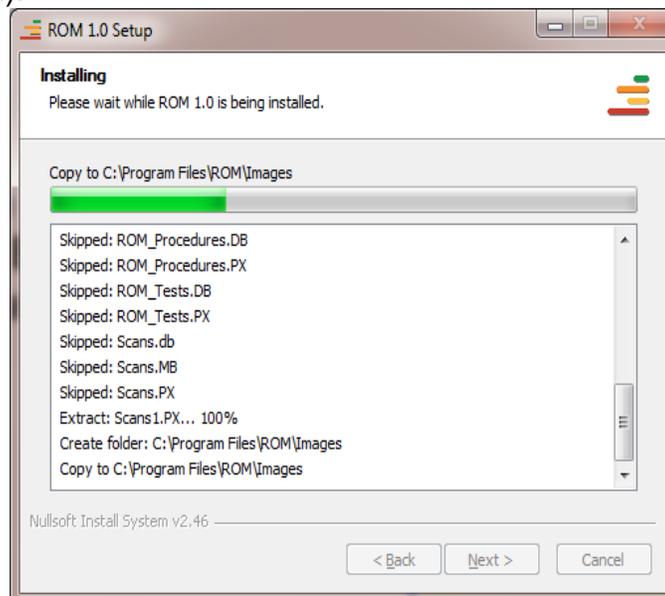
Click **Next** to accept the default Installation Location, or **Browse** to select a different Installation Location.



Choose the Start Menu Folder (by default, Titronics ROM). Click **Install**. The installation process will take a few moments.



Once the Setup Wizard completes, click **Finish** to continue onto the **Configuration Wizard**. (By default, the *Run Titronics ROM* checkbox is selected to continue with the Configuration Wizard).



## Step 2 – ROM Hardware Installation

Connect the **Wireless Hub** or **The Primary Unit** (pictured below) to the computer (the wireless cable has the smaller mini USB plug). To do this, use the correct USB cable – connect one end to the mini USB connection on the Wireless Hub for wireless operation, or the standard USB cable to Primary Unit for wired operation, and connect the other end into an available USB port on the computer.



With the USB cable connected on both ends, the **Found New Hardware Wizard** appears. Select **No, not this time** and click **Next**. (Make sure the installation CD is still in the CD drive.)



Select the option **Install Automatically**. Click **Next**.



If the hardware installation message to the right appears, click **Continue Anyway**. Once the hardware process is complete, click **Finish**.



The ROM Device Hardware and Software are now installed and ready to use. Please see the next page to view the available hardware accessories for the Range of Motion Device.

## Hardware Accessories

Attach the desired **secondary** (measuring) inclinometer (secondary handheld or glasses) to the **primary** (reference) inclinometer using the supplied telephone cable.



**Primary Unit (Unit 1)**

This unit always needs to be connected to one of the secondary units to administer a test. This unit also has the controls for collecting the data. If you choose to keep your unit wired, connect this device to the computer via the USB cable supplied. **To power the device on**, simply press the red button on the face of the device, a red status light will turn indicating the device is ready.

### Secondary Handheld (Unit 2)

This is the standard configuration for measuring extremities, lumbar and thoracic range of motion.



**\*Note the orientation of the units; the telephone jacks face each other for most tests.**

### Glasses Secondary (Unit 3)

The glasses are worn like any other glasses while the test is administered. They are lightweight, a snug fit, and easy to clean between uses. The glasses ensure reliable placement and repeatable results.



### Wireless Hub (comes with wireless ROM)

The Wireless Hub connects to the computer via USB cable and sends information between the primary unit and the hub allowing for wireless testing.





# Setup and Testing

## Setup

Unlike most traditional ROM devices, it is not necessary to reposition the primary (reference) and secondary (measuring) inclinometers during testing. Each inclinometer has 3 angle sensors (x, y, and z) to cover the three testing planes (sagittal, frontal, and transverse). The correct axis for each test is pre-programmed into the unit when a test is created.

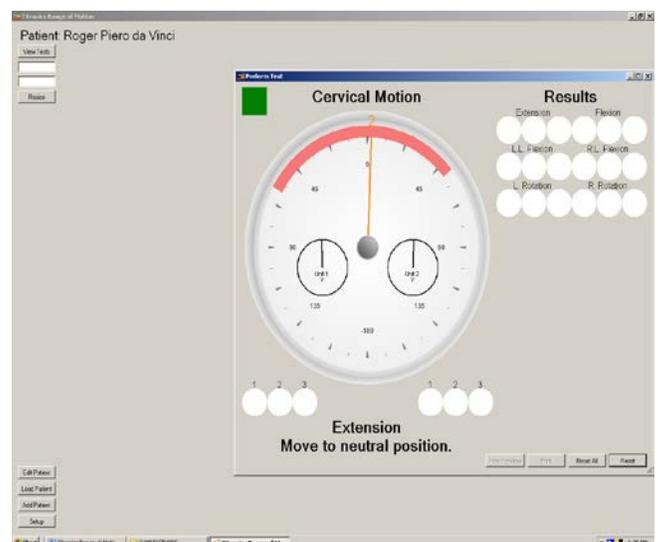
## Testing

### Cervical Range of Motion

Place the reference unit over T1 (make sure the phone jack is pointed towards the head). The reference unit is held in this position through the entire cervical procedure (extension/flexion, left/right lateral bending, and left/right rotation). Ensure a stable grip to avoid device slippage while performing the tests.

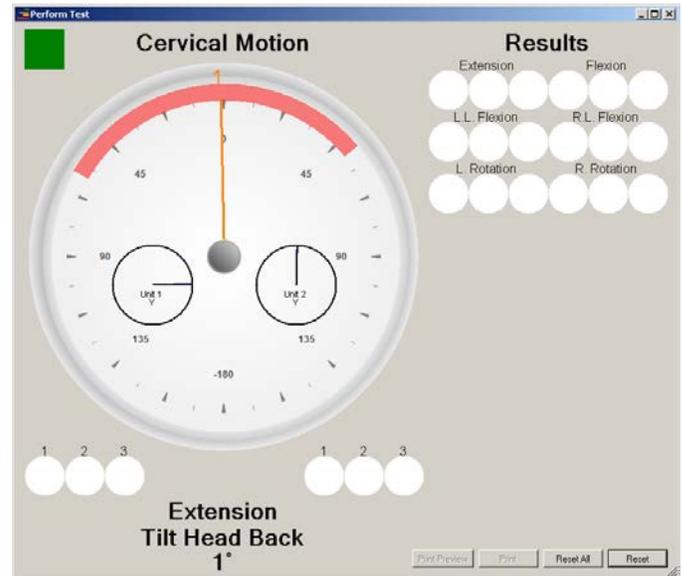
The glasses (with attached primary handheld) are ideal for performing cervical tests – and provide the most repeatable results. Placing the secondary handheld directly on the head may result in slippage, resulting in inaccurate test results.

To start a cervical test, highlight **Cervical Spine Glasses** from the list of available tests and click **Single Test or Triple Test**, in the lower right corner. The Cervical Spine Glasses tests that are being performed in this example will be Cervical Extension/Flexion, Cervical Left/Right Lateral Flexion, and Cervical Rotation.



The main testing screen appears. The test procedure, **Cervical Spine Glasses** in this example, displays above the dial. The large dial indicates the number of degrees between the two inclinometers. The two, inset, dials indicate the relative positions of the individual inclinometers – the reference unit is the left dial, the measuring unit is the right dial. Neutral starting position is indicated by “0” at the top of the large dial. Below the large dial, the test type is displayed, **Extension** in this example.

The Cervical Spine Glasses test consists of three procedures – one in each plane – (S) sagittal, (F) frontal, and (T) transverse. When using AMA guidelines, the test procedure requires three acceptable reps before moving to the next procedure (the software will not allow moving forward to the next procedure until the guidelines are met). **The individual must start at neutral position and return to neutral position before each rep.** Notice in the screen shot to the right that patient instructions are displayed below the test type (**tilt head back**). For AMA guidelines, see *The Practical Guide to Range of Motion Assessment*.

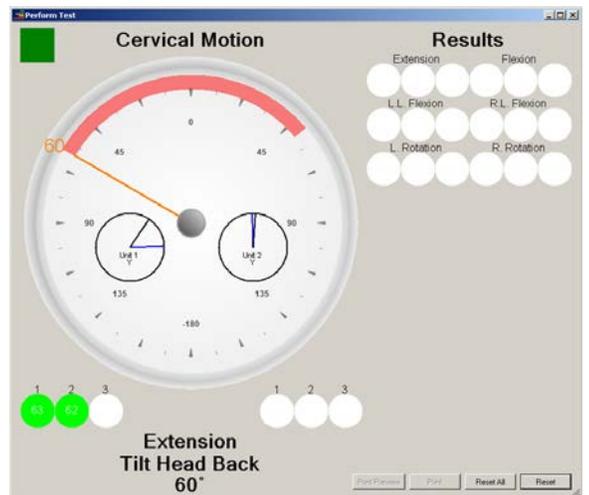


### Cervical Extension/Flexion Test

The first Cervical Spine Glasses test is in the sagittal plane. Ensure the inclinometers are securely attached to the patient. Instruct the patient to assume a neutral position. Once in this position, **press the red button to “zero out”** the inclinometers – this provides reference values to the inclinometers to ensure accurate test results.



Instruct the patient to follow the instructions on the screen. **Press the red button when the patient reaches their maximum position away from neutral.** The angle difference between the two inclinometers (their true extension angle) appears in circle #1. If computer speakers are enabled, a “beep” sounds, indicating a recorded reading. Instruct the patient to return to slightly beyond their starting neutral position (i.e. after tilting their head back to their maximum, instruct them to move

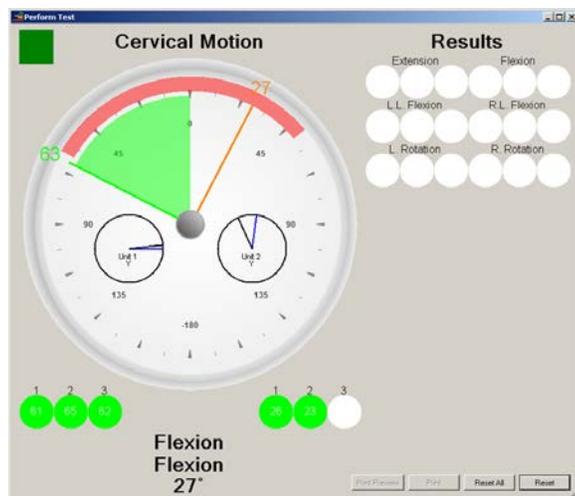


forward a little more than their original neutral position at the beginning of the test). **Once the patient has moved slightly past neutral, a “beep” sounds, indicating the patient may perform another rep.** If the red button is pushed before the patient returns to neutral and the “OK” beep is heard, a different sound will be heard (a catchy tune) and the **“Return to Neutral”** prompt appears.

In the above picture, the two green circles indicate the performance of 2 repetitive reps within AMA acceptable limits. If the patient’s extension was not within the specified tolerance of the previous rep, the rep is rejected, the circle is left blank - the patient must repeat the rep. Only after all three circles are filled can the test move forward to the flexion reps.

To restart the active test at any time, click the **Reset** button. To restart the entire procedure, click the **Reset All** button.

The software moves directly to the flexion test upon completion of the extension test. The patient does not need to “re-zero” – simply have the patient move to maximum flexion and push the red button to measure their first flexion rep. Continue as before until all three circles are filled. Upon successful test completion, the results will transfer to the top row of circles and the next test (cervical left and right flexion) will start. Tests within a selected procedure automatically proceed in the order they were originally programmed.

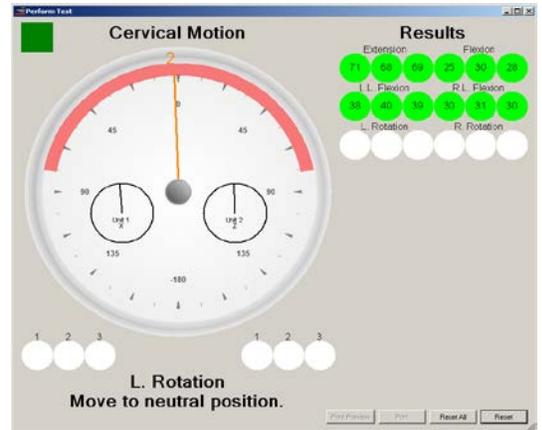


### Cervical Left and Right Lateral Flexion

Use the primary handheld and the glasses for cervical left and right lateral flexion. Once the inclinometers are secure, push the red button to “zero-out” the dial for the lateral flexion test.



As in the previous test, proceed until all circles are filled and the values are transferred to the upper right results section of the screen. Instruct the patient to return to the neutral position to continue with the next set of tests.

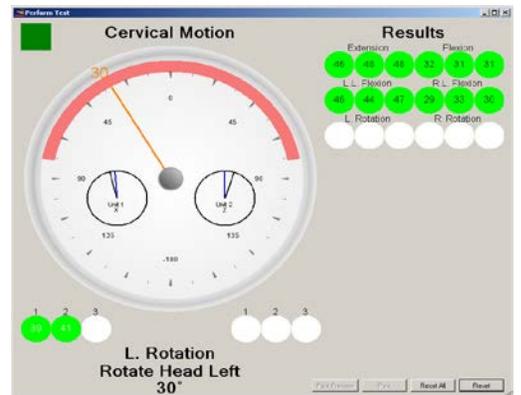


### Cervical Rotation Test

For the cervical rotation test, the inclinometers remain in the same position as the previous tests, but the patient leans forward or lies on their stomach or back, orienting the inclinometers for the optimum accuracy in the S (transverse) plane.

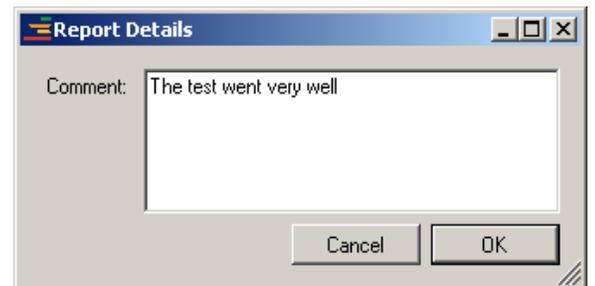


The cervical rotation test starts with the patient “looking” to the left for three reps, then “looking” to the right for three reps.



When the cervical rotation tests are complete, the **Procedure Complete** prompt displays.

The ability to print the results is located in the lower right hand corner of the screen. Click on the **Print** button.



When clicking **Print**, **Print Preview**, or exiting the test (by clicking the **X** in the upper right hand corner of the screen, the **Report Details Screen** appears, allowing for a comment to be entered for the test, and saving the report to the patient file.

When clicking **Print Preview**, after comments have been entered, the screen displays a preview of the report. This preview is the same information saved to the patient file.

*At this time, selecting **Print** from the **Print Preview** screen results in a blank page printing. To print the actual report, exit the **Print Preview** screen, and click the **Print** button.*

Click **Print** to select the printer to receive the report.

The report displays angular limitations in degrees. Please note that the column labeled impairment in the report is NOT a total body impairment rating BUT the actual percentage difference in accordance with the 6<sup>th</sup> edition AMA guidelines. Angles for each test are displayed – along with the minimum, maximum, and average. Impairments are printed in red.



## Lumbar Test

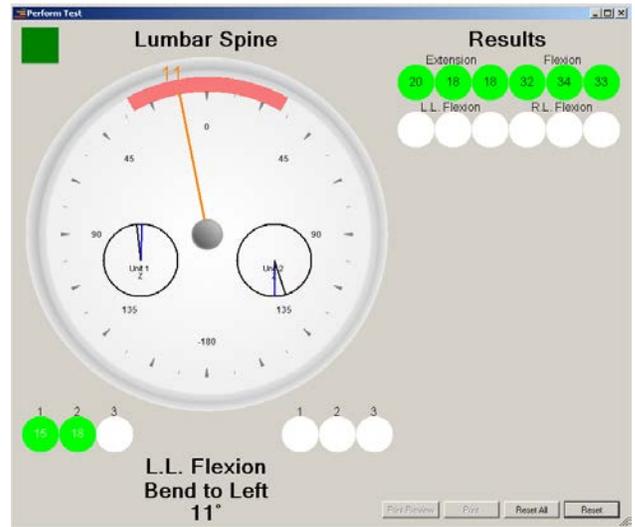
Lumbar and Thoracic test procedures are performed in the exact same manner as cervical tests. Three reps in any plane and direction must meet AMA guidelines for the data to be recorded.

The placement of the reference inclinometer for the Lumbar test is in the S1/S2 area. Place a mark or tape linking left and right PSIS (posterior, superior, iliac spines) just caudal to



the dimples (corresponds with S2 level). The placement of the secondary hand held inclinometer is at T12.

The Right Lumbar Flexion test proceeds after the third L.L. (left lateral) Flexion angle is accepted.



The Lumbar test report for a completed procedure:



## Thoracic Test

The placement of the reference inclinometer for the Thoracic test is T12. The secondary handheld inclinometer is held at T1. As before, the reference inclinometer is below the “active” accessory inclinometer and the telephone jacks “face” each other.

The Left and Right Rotation of the thoracic spine may be measured with the individual in seated or standing position, whichever is more



comfortable. The patient is in a forward flexed position, with the thoracic spine in as horizontal a position as can be achieved.

Neutral position entails arms extended outward and horizontal. The left rotation test involves rotating so the left arm, shoulder, and fingers move upward. The right rotation test involves rotating so the right arm, shoulder, and fingers move upward.

If the patient cannot sufficiently bend forward, another position must be assumed.

The AMA Practical Guide to Range of Motion Assessment (referenced in the appendix) is the best source for details in alternative positions and methods for measuring rotation in the thoracic spine.



## View and Print Previous Tests

To view or print a patient test, ensure the patient is loaded on the Patient Summary Screen. Next, click the **View Test** button.



The View Procedures window appears:

Highlight the desired test and select either the **Preview** or **Print** option.



### Detail on holding the Secondary Inclinometer

When administering an extremity, lumbar or thoracic test the second handheld inclinometer must be used. This secondary unit is designed to allow your fingers to pass through it allowing for more grip on your patients as shown in the picture to the right.



### Turning off and charging the wireless unit

To turn off the wireless (primary) unit, just let it sit idle for 5 minutes. It has a timer that turns it off when not in use. To charge the wireless (primary) unit, simply plug it into a USB port on the computer while the computer is powered on. Overnight is fine (built in smart charger circuit).

# Appendix

Notes on AMA Guidelines:

“All 6 Editions of the AMA Guides (1971-2008) have had the same philosophy about range of motion.

A certain amount of motion is necessary to successfully perform many activities of daily living. Accordingly, there have been tables to rate impairment based on range of motion measurements. There has been no method (no table and no equation) to adjust impairment ratings derived from range of motion measurements for age or sex in any edition of the AMA Guides. Some young people are naturally “stiffer” and some folks who are congenitally given more than average joint motion retain that increased motion (flexibility) well into old age. The later editions of the Guides have included wording that if the contralateral uninjured joint has motion that is less than average, and thus even though the contralateral joint has never been injured it would seem to have an “impairment”, then the examining physician may deduct the “impairment” in the contralateral uninvolved joint from the impairment in the ipsilateral involved joint. (see 5<sup>th</sup> Edition, page 453, or 6<sup>th</sup> Edition, page 461).” -- *response from AMA on motion testing*

\*\*To meet the AMA guidelines the doctor must administer 3 reps of each test. Our software does this automatically, just select the 3 test option.\*\*

\*\*Without proper documentation and clinical meaning of the test, reimbursement will not be issued. Our software allows for notes to be written in the reports at the completion of all tests. The doctor must take the data from the test and interpret it as it pertains to the patient. The chart notes must indicate how the ROM data altered or affected your protocol of care with each patient. If the test is done, and the /clinical meaning of the data is not recorded in your notes, do not expect reimbursement. From the insurance company’s standpoint, if the data did not provide any clinical information, then the test was done purely for the purpose of billing and will not pay you.\*\*

**\*\*This is not a whole body impairment rating system; there are numerous other variables that only the doctor can determine for whole body impairment. Refer to Page 561 Figure 17-2 of the 6<sup>th</sup> edition “Guides to the Evaluation of Permanent Impairment” for an example of how to determine the spine’s contribution to whole body impairment\*\***

Notes on Billing:

The CPT CODE: 95851: Range of motion testing

The average reported billing range is: \$25.00 - \$75.00,

Some states will want the procedure broken down into separate tests or “units”

For example, the cervical ROM procedure involves 3 separate tests or “units”,

Flexion/Extension = 1 unit (\$15.00 to \$25.00)

Lateral Left and Right Flexion = 1 unit (\$15.00 to \$25.00)

Cervical Rotation = 1 unit (\$15.00 to \$25.00)

**You must perform 3 consecutive reps for each test to be AMA compliant.**

For a complete study of the principles for measurement of range of motion (positions, warm-up exercises, preparing the examinee, etc.) please refer to:

Gerhardt J, Cocchiarella L, Lea R. *The Practical Guide to Range of Motion Assessment*, 1st Edition, Chicago: American Medical Association, 2002.

# Contact Us

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