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REPEX™

Manufactured by Hill Laboratories Company

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WARNING

Hill Laboratories Company requires that health professionals using REPEX™ equipment become familiar with the practice of Mechanical Diagnosis and Therapy as taught by the McKenzie Institute International.

The use of REPEX™ equipment by untrained persons may result in injury. Hill Laboratories Company cannot be held responsible for injury caused by the unauthorized use of REPEX™. Qualified health professionals responsible for the supervision of treatment by REPEX™ may be held responsible for injury caused by its unauthorized or improper use.

The following instructions for the use of the REPEX™ table were prepared were prepared by the McKenzie Institute.

Hill Laboratories Company

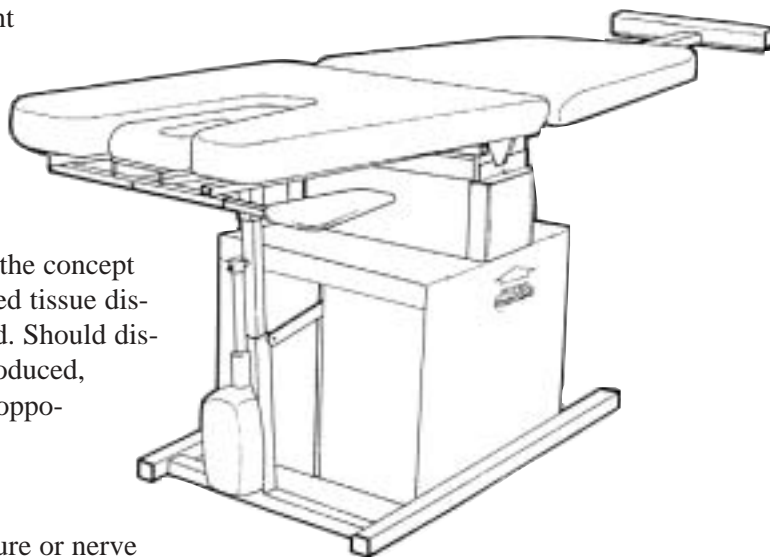
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Introduction

The McKenzie system of diagnosis and treatment for painful mechanical spinal disorders involves the use of repetitive endrange movements which influence the location and intensity of pain arising from the spinal column¹.

The model developed by McKenzie is based on the concept that intervertebral disc fluid, nucleus or dislocated tissue displaces according to the directional forces applied. Should displacement occur to such a degree that pain is produced, repeated movements to endrange applied in the opposite direction will reduce such displacement (the Derangement Syndrome).



Where back pain is caused by scarring, contracture or nerve root adherence and fibrosis, (the Dysfunction Syndrome) remodeling of tissue is possible using repetitive movement⁴. Treatment by progressive repeated endrange movement is the basis for what have become known as “McKenzie Exercises”.

Limitations, however, have been reported using the McKenzie methods. Patient fatigue, for example, has been cited as a limiting factor. Because of fatigue, in one treatment session patients are forced to discontinue exercises at the very time when continuation of them would provide progressive improvement or total relief of symptoms.

A further limiting factor exists where significant loss of movement restricts the patient’s ability to exercise appropriately. Elderly patients and those with problems in joints of the upper extremity are unable to repeat therapeutic exercises to the maximum potential. Thus, recovery is retarded or prevented.

The REPEX™ machine was initiated by McKenzie in 1988 to enhance the effectiveness of repeated endrange movement therapy for mechanical disorders of the low back. The concept of using continuous endrange passive movement was introduced to enable the lumbar spinal segments to be moved to the full available endrange of passive physiological movement a greater number of times than is physically possible using patient generated exercises.

REPEX™ can provide up to approximately 10 cycles per minute of flexion or extension or both.

By applying progressive repeated endrange exercises, patients can frequently experience a rapid centralization, reduction, or abolition of pain. Centralization of pain occurring at the initial evaluation is a reliable predictor of successful outcome². This phenomenon is unique to the McKenzie treatment. With the use of the REPEX™, it is possible to achieve centralization in cases where patient generated exercises carried out over several days have failed to produce change.

A further advantage obtained from the use of REPEX™ is the ability to rapidly reduce derangement even when movement is significantly obstructed, such as occurs in lumbar Derangement Two (Acute kyphosis). Prior to the advent of REPEX™, curve reversal from kyphosis to lordosis in this acute disorder was achieved slowly over a period of time using careful positioning and mid-range movement as behavior of pain allowed. With the correct use of REPEX™, it is now possible to restore full movement within 20 to 30 minutes.

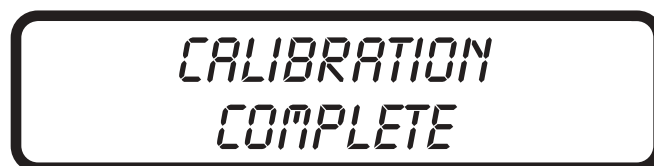
In the treatment of patients with the dysfunction syndrome, the fine control of REPEX™ and the unlimited number of delivery cycles provides a remodeling process unobtainable by patient self-generated exercises.

The McKenzie Institute International has been, and continues to trial REPEX™ in its New Zealand clinics.

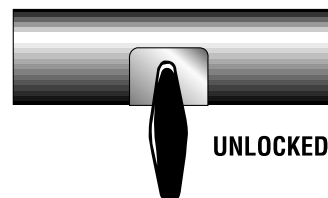
Using the REPEX™ Control Panel

The REPEX™ Control Panel is designed to be completely self-explanatory. By following the step-by-step instructions in the LCD display, you can easily operate the REPEX™ - even on your first try! But, to be sure, we recommend that you practice a few times, without a patient, while following the instructions below.

1. Once your REPEX™ Table is plugged in (refer to the sticker at the head-end of the base for voltage requirement), push the power button found on the side of the table next to the variable speed control. With the power button on, pick up the control panel and press the ENTER button to start the table calibration (NOTE: we recommend that you do not turn the table off after each patient because this would require the table to continually recalibrate; leave the table on and turn it off at the end of the day). The calibration process takes about 19 seconds and when it is finished the display will read “Calibration Complete”.



2. Before positioning the patient, make sure that the leg cushion is **locked** by moving the lock handle as shown in the drawing to the right. Then, position your patient and **unlock** as shown.



3. Next, using the three arrow keys at the top of the control panel, enter the number of cycles that you desire. The display will automatically read '50', however, cycles can be set from 1 - 999. The \leftarrow button will move the cursor from side to side for entering the ones, tens and hundreds digits. Use the \uparrow \downarrow buttons to increase or decrease the numbers in each. Press MENU to lock in setting.



4. Next, enter the degree setting. The display automatically reads 15°. The amount of degrees is calculated as the total amount of angle the patient is moved in a given cycle (extension and flexion). Degrees can be set from 15 - 28; the higher the the setting, the greater the extension. Press MENU.

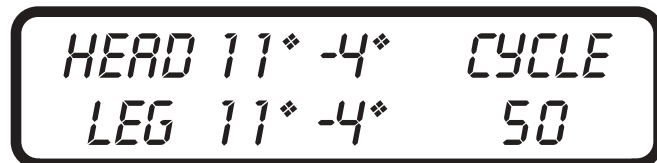


5. Select head-end angle position. The display will automatically read 7 but you can choose from settings 1 - 8. Press MENU.



6. In the same way, select foot-end angle position. Press MENU.

7. Press ENTER to see a display, like the one to the right, which will show all of your settings together. You will then be asked to “push ENTER to accept” or “push HOME to change”.



8. If you press HOME to change selections, the display will take you back to the beginning so that you can reenter your setting. If you are satisfied with the settings, press ENTER at which time the display will ask you to push

ENTER again to move to starting position. This will immediately move the tabletop into position based on the settings that you have selected (at this point you can Manually Adjust - see below). Push START to begin treatment. Once treatment is underway, the settings will continue to be displayed on the Control Panel and the cycles will count down. A beeper will alert you at the end of the treatment. The controller will retain your patient's settings for your reference and records until you change them for the next patient.

PUSH ENTER TO MOVE TO STARTING POSITION

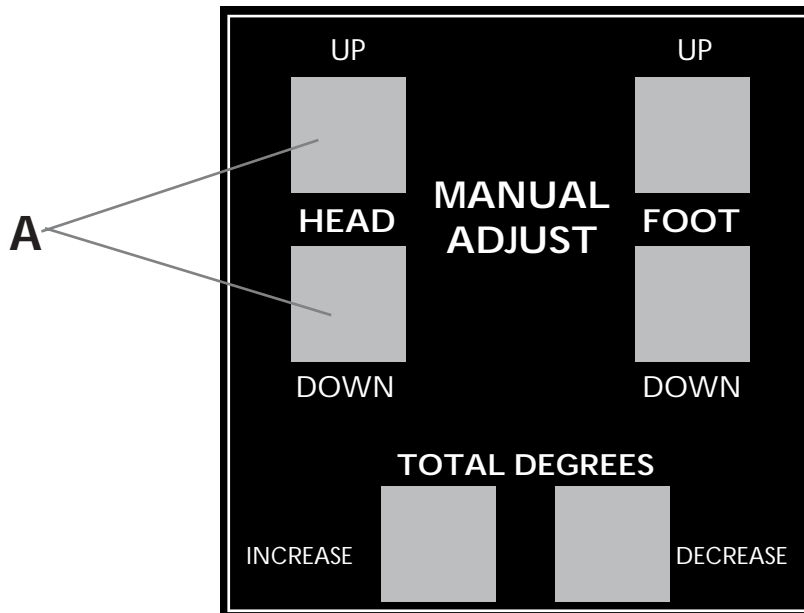
IMPORTANT: *If at any time the procedure needs to be interrupted, pressing the **Red STOP Button** will freeze the table at any point. It is advised, once the treatment has begun, that you return the control panel to its carriage at the head end of the table and instruct the patient that he can press the STOP Button if there is a problem (patient should be aware that this will freeze the table in position and to press the button only when the table is at comfortable point in the treatment cycle). Pressing the HOME button will return the table to a flat, horizontal position. (CAUTION: the table will move approximately 1/2 cycle as it returns to the HOME position)*

Manual Adjust

Use the center area of the control panel labeled 'MANUAL ADJUST' to move the sections of the table further to your liking *after the table is in motion*. **For example:** to move the head-end of your patient up or down during treatment, simply press the 'UP Arrow' or the 'DOWN Arrow' on the side labeled 'HEAD' (see 'A', drawing below). Pressing the button once and letting go will make a change of one position. Press again to change further. Changes can be made in the same way with the Foot Section and the Total Degrees using the appropriate buttons.

It is recommended that these adjustments be made when the cycle is on its way back down to the horizontal position.

The Manual Adjust Buttons can also be used to make setting adjustments just before you press the START Button at the beginning of treatment.



Patient Selection

Indications

All patients considered for treatment by REPEX™ must be evaluated according to the McKenzie assessment system of mechanical diagnosis and therapy **prior to commencing REPEX™ treatment. See THE LUMBAR SPINE, Mechanical Diagnosis and Therapy**¹. This evaluation identifies mechanical responses which indicated patient suitability for the application of REPEX™. REPEX™ is indicated in those patients who are diagnosed as having either Derangement or Dysfunction syndromes, but is not appropriate for patients with Postural Syndrome. Differentiation between **Derangement** and **Dysfunction** syndromes *must* be made.

In the application of REPEX™, the therapist must monitor the behavior of pain and the centralization of pain phenomenon during the initial treatment session.

Direction of movement to be applied by the REPEX™ is determined **IN ADVANCE** following the detailed assessment of the effects of repeated movements on pain centralization, intensity and location. The assessment will also determine the extent and nature of existing limitations in range of movement.

Where limitation of movement occurs, we must determine if the problem is caused by displacement leading to **obstruction** to movement, (Derangement syndrome) or contractures leading to **restriction** of movement, (Dysfunction syndrome). Derangement is usually rapidly reversible, dysfunction is never rapidly reversible.

The assessment must identify the presence and relevance of any lumbar scoliosis and/or kyphosis. Modifications to the starting position on the REPEX™ must be made in the event that either of these acute postures are evident. REPEX™ has lateral compartment compression capability and care must be taken to determine **IN ADVANCE** whether shift correction or lateral compartment pressures will be required during REPEX™ treatment.

Contra-Indications to the Use of REPEX™

All patients considered for treatment by REPEX™ must undergo a complete assessment as described in “the Lumbar Spine, Mechanical Diagnosis and Therapy”¹.

If no movement or position can be found to centralize, reduce or abolish symptoms, the patient should not receive treatment by REPEX™,

The following conditions are contra-indicated in treatment by REPEX™:

1. Malignancies, primary and secondary.
2. Infections of all sorts.
3. Active inflammatory diseases: rheumatoid arthritis, ankylosing spondylitis.
4. Central nervous system involvement: cauda equina lesions, cord signs and symptoms, neurological diseases such as transverse myelitis.
5. Severe bone weakening diseases: osteoporosis, advanced osteomalacia, Paget’s disease.
6. Fractures, dislocations and ligamentous ruptures.
7. Instability.
8. Last two months of pregnancy.
9. Vascular abnormalities: Vertebro Basilar artery involvement, visceral arterial disease, hemophilia.
10. Advanced diabetes- low tissue vitality.
11. Increasing and peripheralization signs and symptoms.
12. Grade three or four spondylolistheis.

Safety Instructions

General Safety

The REPEX™ treatment table must never be used by untrained persons.

Keep clear of moving parts below platform level.

Never reach under the platform when it is in motion.

Always level the platform before allowing patients to mount or dismount.

Never mount or dismount the machine while it is in motion.

Ensure that patient's limbs stay above platform level.

Never allow clothing to drape below platform level.

Only use one button at a time on the three-button hand switch. Do not hold button depressed after maximum stroke has been reached.

Safety in treating the patient.

- 1) **REPEX™ is a potent tool for the alleviation of pain and recovery of function in mechanical spinal disorders. As such, it also has the potential to cause harm if used improperly. Always err on the side of caution.**

Never before has a therapy been available that applies unlimited cycles of endrange extension to the lumbar spine. It is possible to reverse posterior displacement rapidly and efficiently. In early clinical experience, it was found that a number of posterior derangements were simply converted to anterior derangements. This should be borne in mind when monitoring pain responses. Once posterior derangements are reduce and stable, the use of REPEX™ should be discontinued.

- 2) It is best to commence REPEX™ in the mid range of motion until experience has provided finer judgments to be made in selecting starting angles.
- 3) In the case of patients presenting with acute kyphosis or scoliosis and major obstruction to movement from derangement, always commence treatment in the mid range of lumbar movement.
- 4) In the presence of significant dysfunction, adherent or contracted tissues can easily be overstretched if the range of movement is too great of the number of repetitions excessive.
- 5) Under no circumstances should patients with grade three or four spondylolisthesis be treated with REPEX™ equipment. Patients with grade one or two spondylolisthesis may be treated but belt fixation should never be applied.
- 6) In patients with impaired nerve root conduction causing motor deficit, REPEX™ treatment should be avoided until the patient has applied self-treatment procedures for at least three days. This allows sufficient time to determine the effects of patient generated forces on Derangement five and six. Sensory deficit is not a contraindication, but patients with impaired sensation should be monitored carefully.

Safety Instructions

Precautions in the Use of Belt Fixation

Belt fixation with the patient prone has the potential to cause injury. Before applying belt fixation on REPEX™, it is important to manually test for suitability. Provided the “more pressure, less pain” test is answered in the affirmative, belt fixation may be applied

Never apply belt fixation with the table in the horizontal position.

When setting up belt fixation, the stop button should always be readily accessible to the therapist so that excessive forces may be immediately terminated.

The following steps must be followed when applying belt fixation:

- a) Establish the maximum range of extension available prior to placing the patient prone on the REPEX™.
- b) Set REPEX™ to accommodate that range for a trial of ten cycles to assess suitability.
- c) **Apply belt fixation with the patient in the maximum tolerated extended position.**
- d) Tighten the belt with the therapist’s hand interposing between the belt and patient’s back. When the belt firms against the hand, actuate REPEX™ with the hand in place. Allow REPEX™ to run for 3 - 4 cycles. If tolerate, the hand may be withdrawn. Have stop button adjacent during this process.
- e) Belt tension may be adjusted during treatment provided the therapist’s hand is interposed between belt and back on each occasion.
- f) It is unnecessary to apply belt fixation for more than 100 cycles in any one treatment session.
- g) Place stop control within easy reach of patient.
- h) Explain all safety measures to the patient including how to monitor pain peripheralization and stop the table in a horizontal position when feeling insecure or uncertain about the treatment.

The Patient’s Role

When applying patient self-treatment exercises, excessive and damaging movements are perceived immediately by the patient who automatically ceases exercise as pain increases. Avoidance of any significant injury is thus assured.

During the application of REPEX™ treatment, immediate deactivation of the equipment will avoid injury. It is therefore vital that a full explanation regarding the procedures required to stop REPEX™ are conveyed to all patients.

It is important to carefully monitor the patient’s pain and/or neurological status before, during, and after treatment on the REPEX™. Regular questioning of the patient is necessary.

Information regarding pain centralization, peripheralization, or alterations in pain intensity should be obtained **from the patient at intervals during the treatment process**. The range of movement and number of repetitions must always be determined by frequently monitoring the behavior of pain.

The patient must always be instructed to deactivate the REPEX™ if peripheralization or progressively increasing symptoms develop. The patient should have access to an alarm bell to indicate undesirable reactions and/or termination of treatment.

Patient's Role continued:

Patients experiencing dramatic improvement on the REPEX™ equipment are in not doubt regarding the benefits obtained, and take little persuasion to continue at home with exercises that duplicate the effects.

It is essential to explain to all patients treated by REPEX™ that the self-treatment exercises perpetuate the benefits obtained from the equipment and, if practiced every two hours, will continue their improvement Operators Instructions

Operator's Instructions

Operating REPEX™

Roll the foot end in and apply the lock whenever a patient is getting on or off the table. Always release the lock before starting the machine.

Place the patient so that the area subject to the greatest bending will be centered between the two cushions. When the REPEX™ is first turned on, the hand control is preset for the head and foot end at 7 and 15°. If the settings are not changed, the reading is recorded as 7/15/7. This means that the head end moves to 11° extension, 4° flexion. Total degrees of movement is 15° and the foot end also moves 11 extension and 4 flexion. (refer to figure 1). The digital read-out will show

11-4
11-4

Any changes that are made will show on the control panel display.

A change to 7/20/2 indicates 7 on the head end, 20° total, and 2 on the foot end. If lines 7 and 20 intersected, the extension reading is 17° and the flexion is 3°/2 and 20 on the foot end gives a reading of 4° extension and 16° flexion. (see figure 2). The REPEX™ display will automatically indicate this reading, thereby replacing the chart. (the chart is still provided for your reference).

The chart shows what happens as settings are changed. Extension will be increased as the setting is moved toward 8 at the head and foot end. Likewise, extension is increased as the angle setting is moved toward 28°.

	SOLE PISTONS ABOVE HORIZONTAL				SOLE PISTONS BELOW HORIZONTAL				
①	2	1	0	1	2	2	2	3	MAX ↑ FLEXION ↓ MIN EXTENSION ↓ MAX
②	17	17	18	19	20	22	24	25	
③	0	2	3	4	5	6	6	6	
④	15	14	15	16	17	18	20	22	
⑤	3	4	5	7	8	9	10	10	
⑥	12	12	13	13	14	15	16	18	
⑦	5	6	8	10	11	12	13	14	
⑧	10	10	10	10	11	12	13	14	
①	8	8	10	13	14	16	16	18	
②	7	8	8	7	8	8	10	10	
③	9	10	12	15	17	18	20	22	
④	6	6	6	5	5	6	6	6	
⑤	11	12	15	17	20	22	24	26	
⑥	4	4	3	3	2	2	2	2	
⑦	13	15	18	20	23	25	27	29	
⑧	2	1	0	0	1	1	1	1	
	15°	16°	18°	20°	22°	24°	26°	28°	

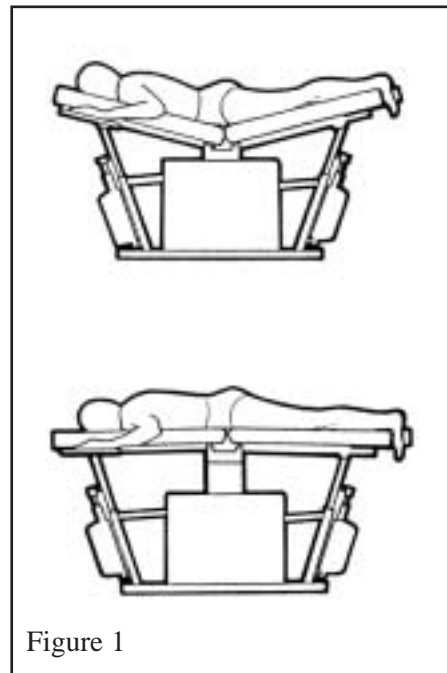


Figure 1

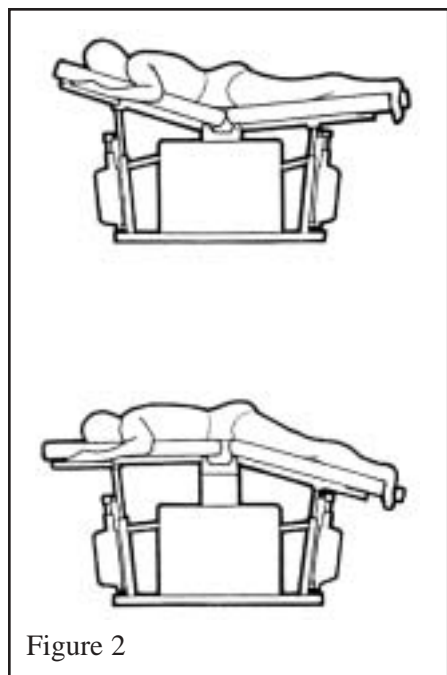


Figure 2

Any increase in the articulation setting should be made either with the table stationary in the horizontal position or during the upward stroke of the ram. Under no circumstances should the articulation setting be increased on downward motion of the ram.

Treatment for Derangement Syndrome

The McKenzie approach to the treatment of the Derangement Syndrome is clearly described in *The Lumbar Spine. Mechanical Diagnosis and Therapy* (1). During the application of the self treatment procedures and techniques of mobilization described by McKenzie, emphasis is placed on the achievement of endrange motion in order to ensure complete reduction of derangement. In treatment by REPEX™, it is also important to **obtain the maximum range of motion possible, governed always by the patient's tolerance**. This specifically applies to Derangement 2 and 4.

Derangement 1

The patient lies prone on REPEX™ with the table in the horizontal position. The patient's waistline should be at the center junction of the table. Adjust foot plate to limit slide.

Recommended angular setting:

Head angle 8°

Articulation 15°

Foot angle 8°

At the point when pain is either abolished or at its minimum, and provided it is impossible to further increase range of motion, allow REPEX™ to complete another 40-50 cycles at that setting. The usual number of repetitions is 100-200 total per treatment.

At conclusion of the treatment session, allow the patient to rest prone for two to three minutes. As recurrence of derangement after REPEX™ is always a possibility, instruction in the regular performance of exercises for the self treatment of Derangement One should be provided. After two to three minutes resting, the opportunity should be taken to educate the patient in the practice of extension while lying BEFORE getting off the table. During the process of moving from lying to standing, it is of the utmost importance that the patient maintains the lordosis. Once standing, allow the patient to move about. Some soreness can be expected following completion of treatment.

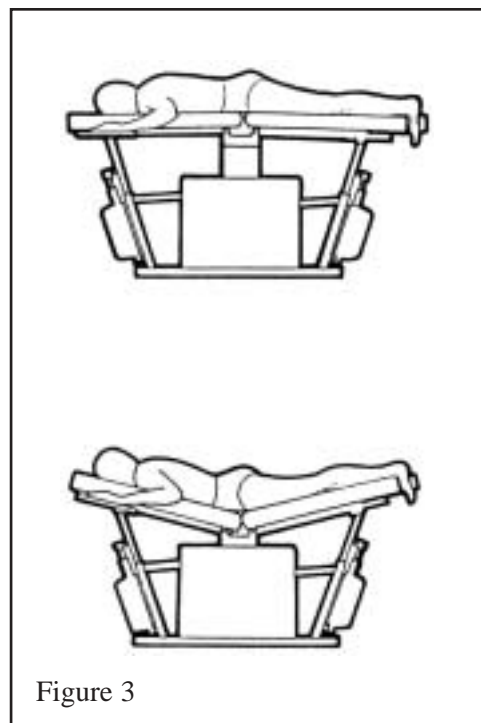
Instruct in the maintenance of lordosis and correct sitting procedures. Always provide a lumbar roll for this purpose. The usual McKenzie self-treatment methods should be practiced at home or at work every two hours between REPEX™ treatment sessions.

REPEX™ treatment should be applied daily as long as symptoms are subsiding. Repeat treatment angles on REPEX™ should commence at approximately 5° to 10° below the previous maximum setting.

If not completely reduced in three days, overpressure may be required and belt fixation may be indicated. This must be applied with caution. Before using belt fixation, refer to page 8 under "SAFETY INSTRUCTIONS - Precautions in the use of belt fixation". Once the pain is reduced or abolished, belt fixation will not be required.

If pain is increasing:

Under certain circumstances, pain may be reduced or abolished at the maximum of the extension cycle when the articulation is at its lowest point. The pain may increase when the patient moves into flexion when the articulation is at its maximum height. This is an indication that the flexion angle should be decreased and the extension angle increased until pain felt at the height of the articulation ceases. A pillow under the chest may be required in a few cases. This will prevent any flexion occurring at the height of the ram excursion.



Derangement 1 (continued)

Check to ensure the patient is relaxed. As the range of movement increases, it is important the patient relaxes so the movement is completely passive and is not resisted by patient tension.

Check to determine if the symptoms are strain or pain.

Check to determine if the pain is a new pain or is the original symptom.

Check if range of movement setting is too high. If so, reduce angle.

Check to determine if pain is in a different location. If centralized - proceed. If peripheralized, adjust hips or discontinue and reassess.

If pain progressively increases despite a reduction in the range of applied movement setting, it will be necessary to reassess the condition to exclude the possibility that an anterior derangement or significant extension dysfunction is responsible for the increasing pain. Recheck present and previous history and retest using patient generated forces. Reassess the following day.

If atypical responses are obtained from mechanical assessment and REPEX™, refer for further investigation.

Derangement 2

Assess the extension range of movement and determine the degree of obstruction to extension. Significant obstruction to the movement of extension will require a more flexed starting position. Assess the effect on pain resulting from extension. Present the REPEX™ at a flexed angle sufficient to accept the patient prone without severe provocation of symptoms. The patient's waistline should be at the centre junction of the table.

Recommended angular setting: 8/15/3. (refer to Figure 4)

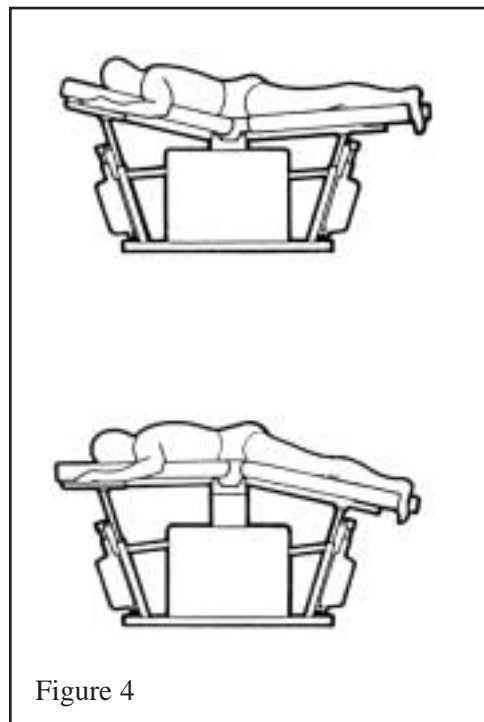
Establish the intensity and location of pain.

Occasionally the foot and/or head position may require a lower setting. This will be necessary when the kyphosis or flexion deformity is extreme. Some discomfort and pain at end range of extension should be felt. This should reduce over 15 to 20 cycles.

If pain progressively increases at or near the maximum of the extension cycle, lower the foot end to setting 2 or 1, if necessary.

If pain increases at or near the maximum of the flexion cycle, raise the foot end to setting 4 or 5, if necessary.

As the derangement and pain reduce, the foot section should slowly be raised to 8. The articulation may then be progressively increased from 15° as dictated by the patient's condition. This is usually possible in 10 to 15 minutes. Providing pain continues to reduce as extension range increases, treatment may be continued as for Derangement One.



On completion of treatment by REPEX™, the patient should relax for two to three minutes. After this time, the patient must perform 10-15 cycles of extension in lying to assess the extension range of motion achieved and to teach self-treatment procedures. The patient must follow self-treatment principles between treatment sessions and practice extension while lying repeatedly at hourly intervals at home. The use of a lumbar roll is also necessary when sitting.

Should belt fixation be required on subsequent treatments, refer to page 11 under Precautions in the Use of Belt Fixation prior to commencing its use. Once pain is reduced or abolished, belt fixation will not be required.

Derangement 3

The management of the patient with Derangement 3, including the assessment, REPEX™ settings and progressions, and self-treatment program must be applied in the same sequence and manner as described for Derangement 1. The patient's waistline should be at the centre junction of the table.

Recommended angular setting: 8/15/8. (Refer to figure 5)

Establish the intensity and location of pain.

If reduction, centralization or abolition of pain fails to occur with simple sagittal extension, it will be necessary to apply lateral compartment pressure and shift the patient's hips away from the side of pain. The lateral shift componentry should be used for this purpose. Identify manually the probable degree of correction required prior to applying componentry.

Once centralization, reduction, or abolition of pain has occurred, the lateral shift componentry should be removed and treatment continued as for Derangement 1.

If necessary, the patient must be taught to include hip shift to enhance the effectiveness of extension in lying when applying the self treatment procedures.

Should belt fixation be required, refer to page 11 under “**SAFETY INSTRUCTIONS Precautions in the Use of Belt Fixation**” prior to commencing its use. Once pain is reduced or abolished, belt fixation will not be required.

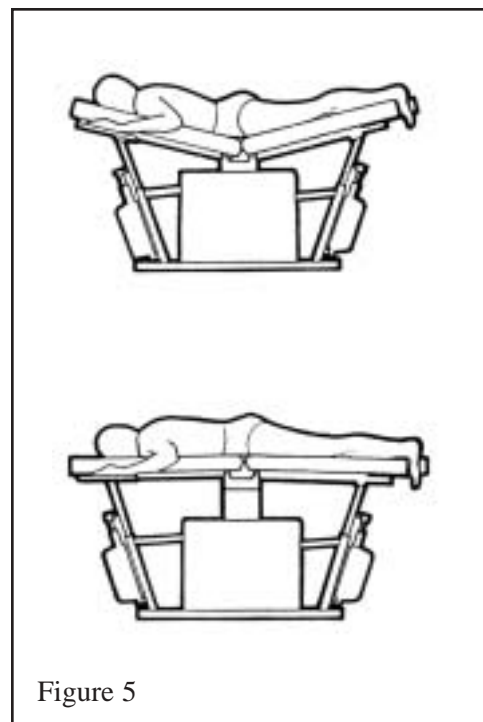


Figure 5

Derangement 4

Manual correction of derangement in patients with acute lumbar list or lateral shift is frequently achieved in one or two treatment sessions. In certain cases, however, correction can take longer and, in others, reduction can be unstable. It is in these cases that REPEX™ provides significant benefits when used by trained and experienced therapists. Even in those more resistant cases, it is common for a lateral shift to be corrected and pain to be abolished from a single treatment of REPEX™. This result is more likely to be achieved if the patient continues to regularly apply self correction of the shift followed by extension in lying.

Derangement 4 continued:

Prior to applying REPEX™, as much correction of the lateral shift as is possible should be obtained in the standing position. (For details, see “The Lumbar Spine, Mechanical Diagnosis and Therapy” (1)) If self-correction of the lateral shift is relatively easy to perform, the therapist should fully instruct the patient in this procedure. This will allow the patient to apply self-correction regularly at home or at work. This education is vital if complete reduction is to be maintained.

Adjust the REPEX™ to the horizontal position and have the patient lie prone. (In some cases a more flexed position may be required as in Derangement 2). The lateral shift componentry should be applied to maintain full correction of the shift if this is possible. The patient’s waistline should be at the center junction of the table.

Recommended angular setting: 8/15/8. (Refer to figure 6)

Establish the intensity and location of pain

In most cases, gradual progression through increasing angles to maximum range of about 8/24/8 should be possible. 100 to 200 cycles may be necessary.

If the laterally shifted posture forced by the derangement is significant and the pain severe, it may be necessary to commence the correction in a more flexed position and settings of 8/15/3 may be required. Continue treatment as for Derangement 2, gradually decreasing flexion and increasing extension until end range is achieved or the pain centralized or abolished. Shift correction componentry may require adjustment during treatment to ensure consistent lateral correction is achieved.

Once the pain is centralized or abolished, remove the lateral shift componentry and perform 30-50 cycles to ensure the maximal mechanical effect of reduction.

In the case of acute ipsilateral shift, it may be necessary to test the effects of shifting the patient’s hips towards the painful side during the first few cycles.

During subsequent treatment on the REPEX™, it is advisable to continue to apply lateral compartment pressures especially if the pain location is unilateral. Careful monitoring of pain location will be necessary to prevent over-correction.

Should belt fixation be required, refer to page 11 under “SAFETY INSTRUCTIONS-Precautions in the Use of Belt Fixation” prior to commencing its use. Once pain is reduced or abolished, belt fixation will not be required.

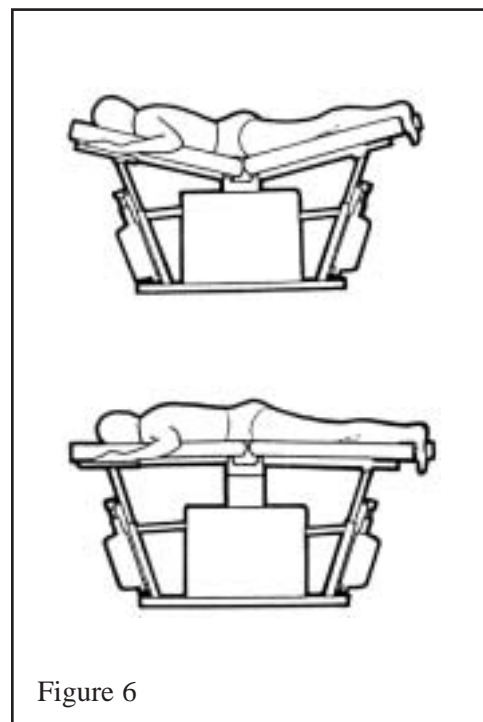


Figure 6

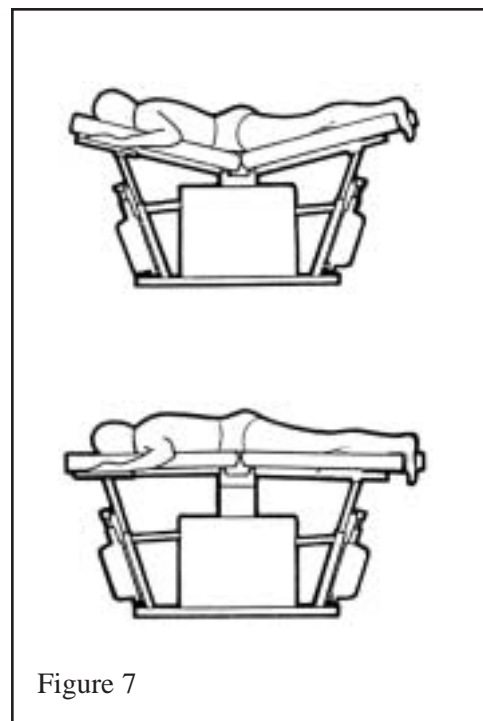
Derangement 5

In general, Derangement 5 may be treated in the same manner as described for Derangement 3. Because of the posterolateral component present in this derangement, the most peripheral symptoms should be monitored constantly during the first few cycles. The patient's waistline should be at the center junction of the table.

Recommended angular setting: 8/15/8. Refer to figure 7?

Establish the intensity and location of pain.

Should belt fixation be required, refer to page 11 under "**SAFETY INSTRUCTIONS - Precautions in the Use of Belt Fixation**" prior to commencing its use. Once pain is reduced or abolished, belt fixation will not be required.



Derangement 6

In general, Derangement 6 may be assessed and treated in the same manner as described for Derangement 4. However, with symptoms radiating below the knee, pre-REPEX™ assessment must be meticulous. Positioning REPEX™ prior to activation for the reduction of Derangement 6 may require extensive exploration before a satisfactory starting position can be identified. A significant degree of flexion may be required in some cases. If so, the setting prior to commencement may vary considerably. The patient's waistline should be at the center junction of the table.

Recommended Angular Setting - subject to assessment.

Establish the intensity and location of pain.

Progressions in the use of REPEX™ in Derangement 6 should be made with care and the patient's symptoms monitored frequently until the nature of the responses has been accurately determined. Frequent interruption of REPEX™ and reassessment of the effects should be made every 40-50 cycles.

Should belt fixation be required on subsequent treatments, refer to page 8 under "**SAFETY INSTRUCTIONS - Precautions in the Use of Belt Fixation**" prior to commencing its use. Once pain is reduced or abolished, belt fixation will not be required.

If there is any doubt regarding the suitability of any patient for treatment on REPEX™, 24 to 48 hours of self-treatment procedures should be performed prior to the administration of REPEX™ therapy.

Chronic Disorders

The diagnosis of chronic low back pain implies that those affected suffer continuous pain and have no pain-free periods. The view is also widely held that these patients must live with their problem and that chances of recovery are remote.

In reality, a majority of patients, perhaps as many as 80 percent, do not have continuous low back pain.

They suffer frequently recurring episodes that create the impression that pain is continuous, whereas there may be periods of days or weeks between episodes when no pain is experienced. Thus, instead of receiving appropriate treatment for recurring internal derangement (which required education in self-treatment procedures), the patient is referred to a chronic pain center.

Centers treating chronic-pain patients frequently advise reduction of activity levels by either cutting out activity entirely or restricting motion by attempting to stabilize segments of the spine during activity. The consequences of such advice create in the patient's mind the idea that activities and movement are harmful. As a result, patients with chronic back pain, afraid of moving, lose mobility of soft tissue, joint flexibility, and muscle strength. Thus, with progressive deterioration of the spinal musculo-skeletal system, segments above the affected area become stiff and painful with neck and thoracic symptoms following long after the onset of low-back pain. The treatment of such dysfunction requires remodeling.

REPEX™ provides a new dimension in the treatment of dysfunction. Clinical experience to date suggests that remodeling may be significantly accelerated with REPEX™.

Dysfunction

The Exposure of Underlying Dysfunction

It is rare for patients with dysfunction (adaptive shortening or contracture) to present for treatment for the dysfunction itself. It is more often the case that a recent recurrence of derangement forces consultation. Only following reduction of the derangement does it become apparent that the patient has pre-existing dysfunction. The pain produced by the derangement itself does not allow detection of the underlying dysfunction at the time of assessment. When using self-treatment procedures, differentiation between dysfunction and derangement is easily made because the change in the nature of the pain will occur over several days of the treatment. The patient is able to perceive and describe the changes.

When using the REPEX™, however, the rapidity of reduction of derangement is such that the patient has difficulty in describing his symptoms in a manner that allows the therapist to identify that moment when the derangement is finally reduced and stretching of the underlying dysfunction commences.

Thus, it is possible that overstretching of contracted structures may occur when using the REPEX™ equipment for the reduction of derangement. Where this occurs, the patient will experience a soreness and an aching of a different quality. His mobility will be largely restored but some persisting aching, probably of chemical origin, may be present for up to 72 hours after the initial REPEX™ treatment. The patient should be warned that this may occur and be reassured as to the precise nature of this discomfort.

On identifying the presence of underlying dysfunction following the reduction of derangement, modification to the application of REPEX™ may be required to treat the dysfunction itself. Settings on REPEX™ may require slight reduction in the early phases of the treatment of the dysfunction.

The Treatment of Dysfunction

The aim of treatment for patients with the Dysfunction Syndrome is to remodel contracted or adherent tissue to a functional length, thus restoring mobility to the greatest extent possible considering the nature of the injury.^{3,4}

It is important that the restricted spinal segment is not forced excessively beyond its limited range of motion. REPEX™ has the capacity to overstretch and treatment of dysfunction should progress slowly in comparison to the rapid progressions applied to patients with the Derangement Syndrome.

Within one hour of completing treatment by REPEX™, discomfort resulting from stretching should have subsided. Pain persisting for two to three days following REPEX™ indicates that overstretching may have occurred. It is advisable to wait until any exacerbation has subsided before recommencing REPEX™ at lower settings.

Because wide variations exist in the extent and nature of dysfunction, it is not possible to recommend a specific starting angle. Rather, it is best to obtain from the pre-REPEX™ assessment the likely range of motion and calculate from that the most appropriate setting.

Extension dysfunction

During the treatment of extension dysfunction in the lumbar spine, use of the REPEX™ to remodel contracted tissues should cause minor strain pain at the endrange phase only.

In the case of extension dysfunction, a general practice should be to adjust the head and foot settings at 5 and activate the table until the horizontal position is reached. The patient may then lie prone on REPEX™ and the table may be activated.

During the first treatment, as the patient becomes accustomed to the motion following 10 cycles, the setting may be progressed to 6, first at the head and then at the foot end. After a further 10 cycles, provided the patient is tolerating the effects, progression should be made to setting 7. This sequence may be repeated until both head and foot settings are at 8.

The range of motion may be increased until the patient feels “strain” pain at the lower point when the cycle is completed. This ensures that intermittent stretching is occurring without excessive force involved.

If, at any time, the pain increases in intensity or becomes constant, the REPEX™ should be deactivated.

The maximum number of cycles performed during the treatment session should be 100-150 repetitions and the patient treated daily for the first week. Subsequently the REPEX™ treatment should be applied two to three times per week for six to ten weeks. During this period, the articulation setting is gradually increased as pain allows.

During this period, the patient must be instructed to perform the conventional McKenzie self-treatment program at home.

Flexion dysfunction

In treating flexion dysfunction, experience so far has not demonstrated REPEX™ superiority over self-treatment procedures. This, however, does not mean that there will not be an occasion when the use of REPEX™ may be indicated or preferred.

Dysfunction continued:

Treatment of nerve root adherence and entrapment

Following the resolution of the acute stage of sciatica (10 to 12 weeks), residual symptoms persist frequently because of nerve root adherence. Nerve root adherence can develop without the patient having previous surgery, although surgery itself is probably the most common cause. Remodeling of scarring and/or fibrosis is necessary in these cases and early treatment is strongly advised. Testing procedures as described in “The Lumbar Spine. Mechanical Diagnosis and Therapy”¹ should be applied to ensure differentiation has excluded intermittent bulging of the disc as the cause of the persisting symptoms.

Self-treatment procedures for stretching of nerve root adherence must precede the application of REPEX™. Flexion in lying and sitting must be progressed over a period of seven to ten days to determine the stability of the posterior annulus. See “The Lumbar Spine. Mechanical Diagnosis and Therapy”¹. Provided that during this period the patient experiences not lasting exacerbation of distal symptoms, REPEX™ may be commenced. Treatment to recover function in nerve root adherence may take six to twenty weeks depending on the length of time since onset. It is not necessary for REPEX™ to be applied over the whole of this period.

REPEX™ should be placed in the horizontal position after preadjustment of both the head and foot settings to 5 and the articulation angle at 15°. Attach the back rest componentry to the head end of REPEX™. Place the patient in the sitting position reclining against the back rest at its lowest angle. Apply belt fixation just above the patellae to prevent knee flexion.

The location and intensity of the patient’s symptoms should be recorded.

Activate REPEX™ and after the patient has become accustomed to the motion (10 cycles), gradually increase the range of movement by raising the back rest to its maximum. Once the patient indicates that symptoms are produced or increased at the maximum flexion angle, REPEX™ should continue at that setting for 50 to 60 cycles.

Careful monitoring of symptoms during this period is essential. At the maximum angle of flexion, the symptoms should appear or increase. At the minimum angle of flexion, the symptoms should subside to their normal level. No remodeling will occur if the patient feels no discomfort. Some strain pain must be tolerated.

Progressions are indicated as soon as the patient describes reduction in intensity of pain experienced during the stretching process. As stretching and remodeling progresses, further increase in flexion angle can be obtained by progressively raising the articulation setting.

On completion of flexion applied by REPEX™, it is necessary for the table to be deactivated at the horizontal position and the patient instructed to lie prone and complete five to ten extensions in lying exercises. See “The Lumbar Spine. Mechanical Diagnosis and Therapy”¹.

At the first treatment, the patient should receive no more than 75 cycles. Treatment should be repeated daily for about a week, the number of cycles and the angle of flexion slowly progressing according to the patient’s tolerance (100-150 per session). In the second week, the patient should reduce the frequency of treatment to every second day.

The patient must continue at home with the routine McKenzie exercise program for self treatment of nerve root adherence.

Persisting increase of peripheral symptoms indicates the need for reassessment for differentiation between intermittent disc bulging and nerve root adherence.

See “The Lumbar Spine. Mechanical Diagnosis and Therapy”¹.

References:

1. McKenzie, R.A.: The Lumbar Spine, Mechanical Diagnosis and Therapy, First Edition, Spinal Publications, Lower Hutt, New Zealand, 1981
2. Donelson, R.; Murphy, K.,; Silva, G.: Centralization Phenomenon: Its usefulness in evaluating and treating referred pain. Spine 15:3, 1990.
3. Evans, P.: The Healing Process at Cellular Level. Physiotherapy 66:8, 1980
4. McIlwaine, W.A.: A Technique for Improving Results of Soft Tissue Repair in Low Back Patients Utilizing the LPM 100.

M C K E N Z I E

REPEX

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**For use with the REPEX™ Table
for treatment of Mechanical Spinal Disorders**

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