
بسم الله الرحمن الرحيم

OCCUPATIONAL THERAPY FOR THE LOWER LIMB

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Objectives:

1- To understand Normal Use and its Demands on Muscle and joint Function.

2- To identify treatment priorities for the Different joints.

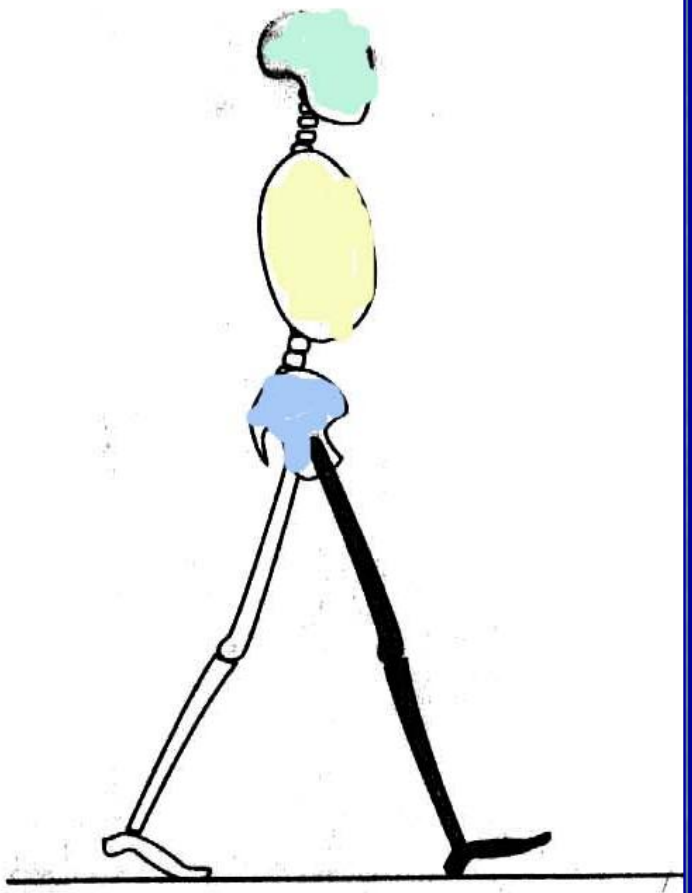
3- To Recognize treatment potential of a bicycle for the lower limb.

4- To Recognize treatment potential of an ankle treadle.

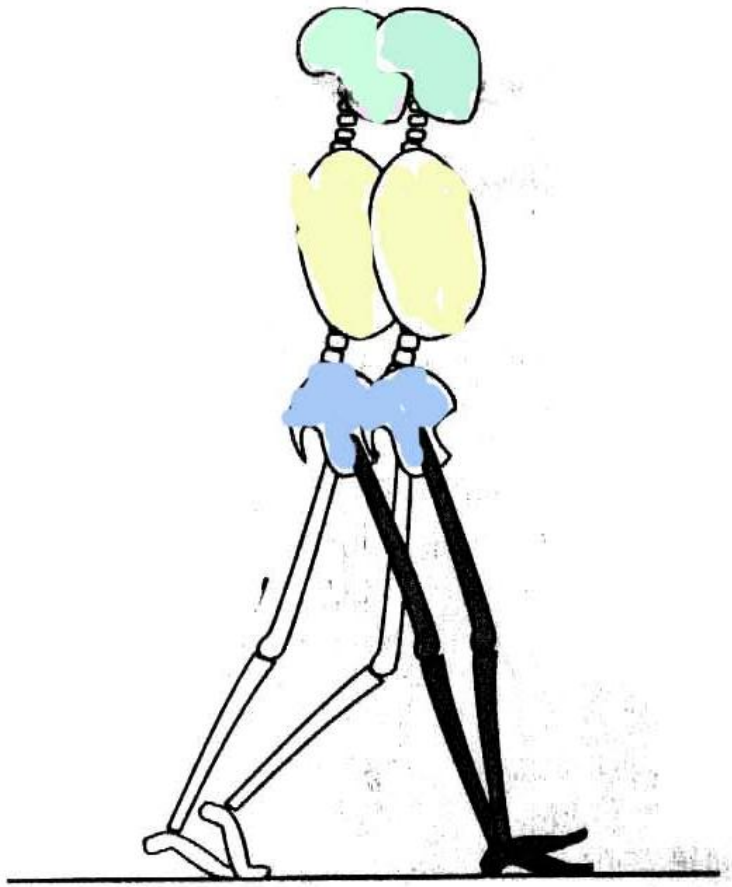
5- To Recognize treatment potential of a footpower lathe.

Mobility and antigravity muscle strength for sitting, standing and walking are the basic needs for everyday use.

Coordination of hip, knee and foot is fundamental for good performance and loss of function in one part prohibits normal use of the others



Initial Contact



Loading Response

Along period of non-weight-bearing is detrimental to muscle tone throughout the limb, especially to the muscle groups which are accustomed to take the full body weight, the glutei, quadriceps and calf muscles

Therefore, in addition to local treatment for the injured part, the whole limb must be strengthened to regain normal function.

Treatment Priorities for the Different Joints

Hip

1)To strengthen the glutei for extension of the joint and for control of the pelvis on the femur when weight-bearing.

2)To increase pain-free range of flexion for sitting.

3)To strengthen the hip flexors for walking and stair climbing.

4)To relate the above to correct walking.

Knee

1)To strengthen the quadriceps for stability, for anti gravity thrust, and for eccentric control when weight-bearing, e.g. the act of sitting down or coming downstairs

2) To increase flexion to a minimum of 90°.

3) To relate the above to correct walking

Ankle and foot

1)To strengthen the calf muscle for weight-bearing, i.e. raising the heel for push off in walking.

2)To mobilize dorsi-flexion and plantar flexion.

3) To mobilize the metatarsophalangeal joints, especially extension, for the position of weight-bearing on the ball of the foot.

4) To strengthen the dorsi-flexors.

5) To maintain and strengthen the arches of the foot.

6)To relate the above to correct walking

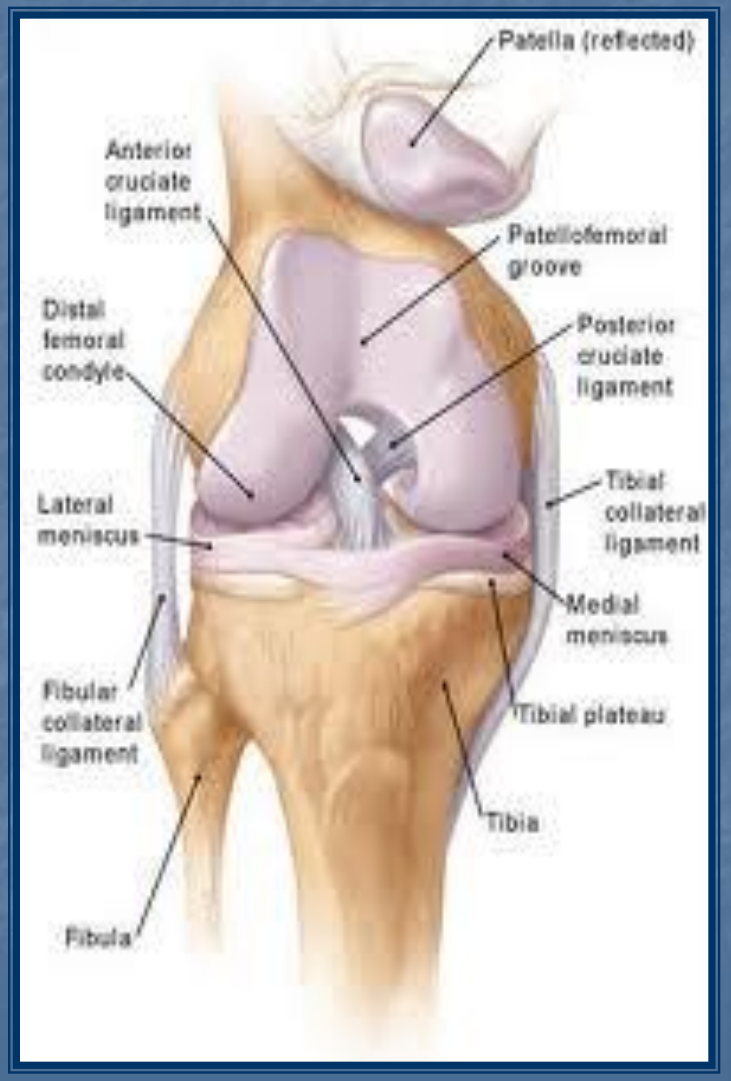
Fractured neck of femur

The patient is usually elderly and the physiotherapist begins general mobilization within days of surgical fixation of the fracture. The aim is to have the patient walking before the habit is lost and before muscle power deteriorates through disuse. Local treatment for the hip is rarely needed.

Instead, after about ten days, assessment of likely A.D.L. problems and training in safe mobility for home are the priorities.

Injuries to the knee joint other than fractures

- The knee is especially prone to injury, being a hinge joint acting between two long bones. It is dependent for lateral stability on its collateral ligaments and to a lesser extent on its menisci.
- For antero-posterior stability the joint relies on the cruciate ligaments.
- Strong quadriceps are essential for the normal knee joint. When there is injury the muscles deteriorate markedly.



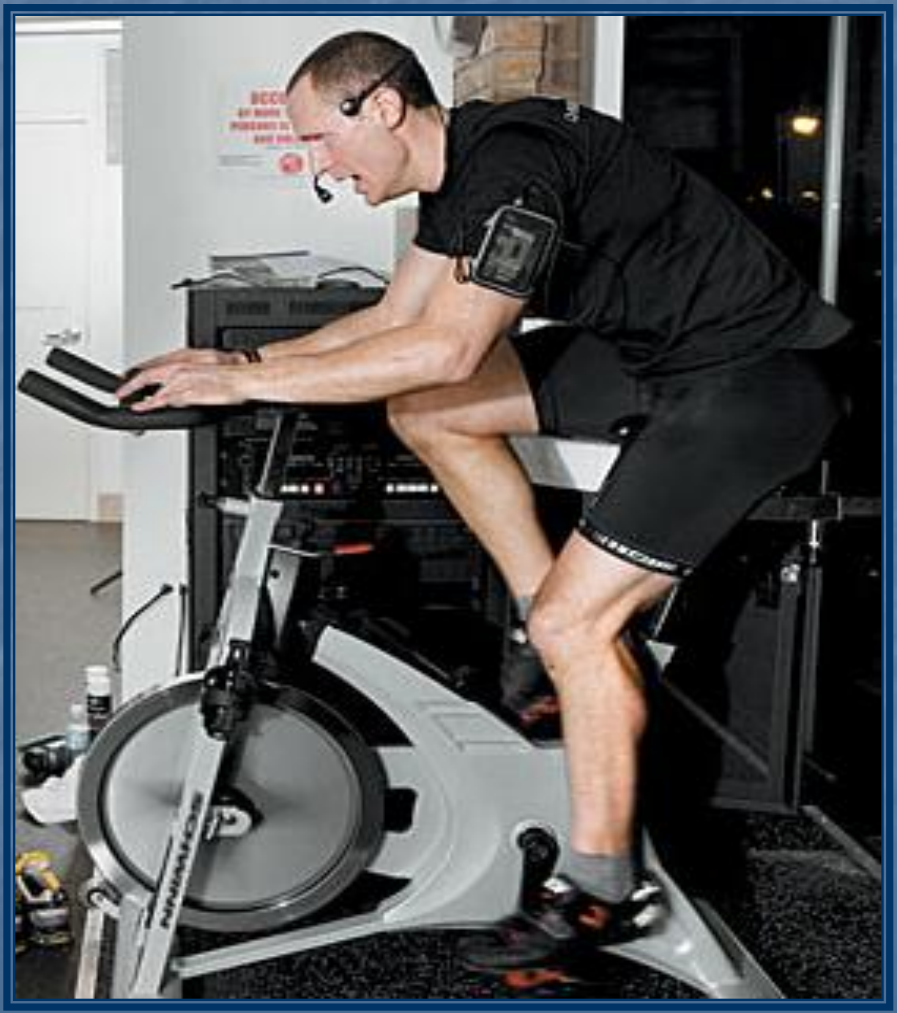
Canvas sling

Injury to the ankle other than fractures

Treatment may be prescribed for a patient with recurrent sprain of the ankle. Women predominate.

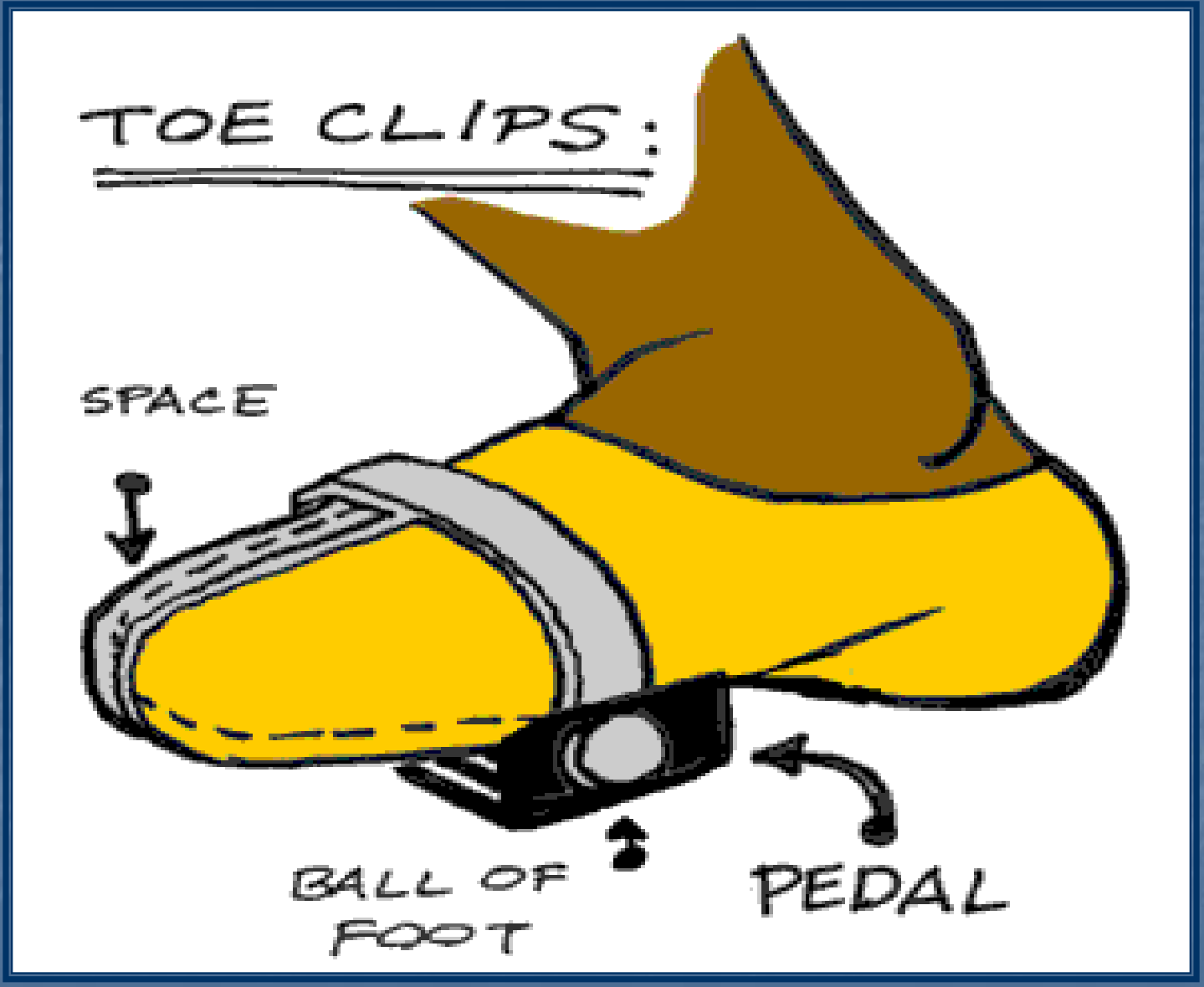
In addition to general strengthening while avoiding the position of trauma, advice about suitable footwear may be needed

Treatment Potential of a Bicycle for The Lower Limb



Muscle Work

- The reciprocal movement is directly related to walking, it is easily adjusted for different needs and it is suitable both for patients not yet allowed to take body weight and for those who are.
- Careful instruction is needed to teach each patient how he must use it. For example, the patient with weakness of his left leg might work rhythmically but with over-emphasis on the thrust of his strong right leg
- Over-correction is unlikely but the emphasis will become more nearly equal and the muscles of the left leg will contract more strongly.


TOE CLIPS:
SPACE
BALL OF FOOT
PEDAL

Mobilization

With accurate adjustment a good range of flexion and extension can be obtained in the ankle and knee. Because the final degrees of extension of the knee are completed with rotation, this does not occur, for the continuous movement allows no time to lock and unlock the joints.

The patient can, however, be told to brace his knee in full extension and to hold it

Adaptability

An adjustable work table on a bicycle is important, both so that it can accommodate a tall patient working in maximum flexion with long pedal shanks without hitting his knees, and also to ensure the possibility of good posture for patients of all heights.

Treatment Potential of an Ankle Treadle

Muscle Work

The treadle sewing machine, allows for simultaneous action of the feet, placed side by side, toes in front of the fulcrum and heels behind it. The knees should always be kept together too: this is often difficult. Once the action is learnt, and when strength and range are adequate, some patients can be progressed to keeping the movement going with one foot only.

Mobilization

- A treadle action is good for mobilizing and full range movement can be achieved.
- The ankle treadle is suitable for patients not yet weight-bearing, with one proviso. There must be enough movement and power to work rhythmically without strain.

Adaptability

It is essential to be able to alter the range of movement. It is an advantage if the height of the work top can be changed too, not only to ensure good posture but for the patient who must sit on an exceptionally high seat because of very limited knee movement.

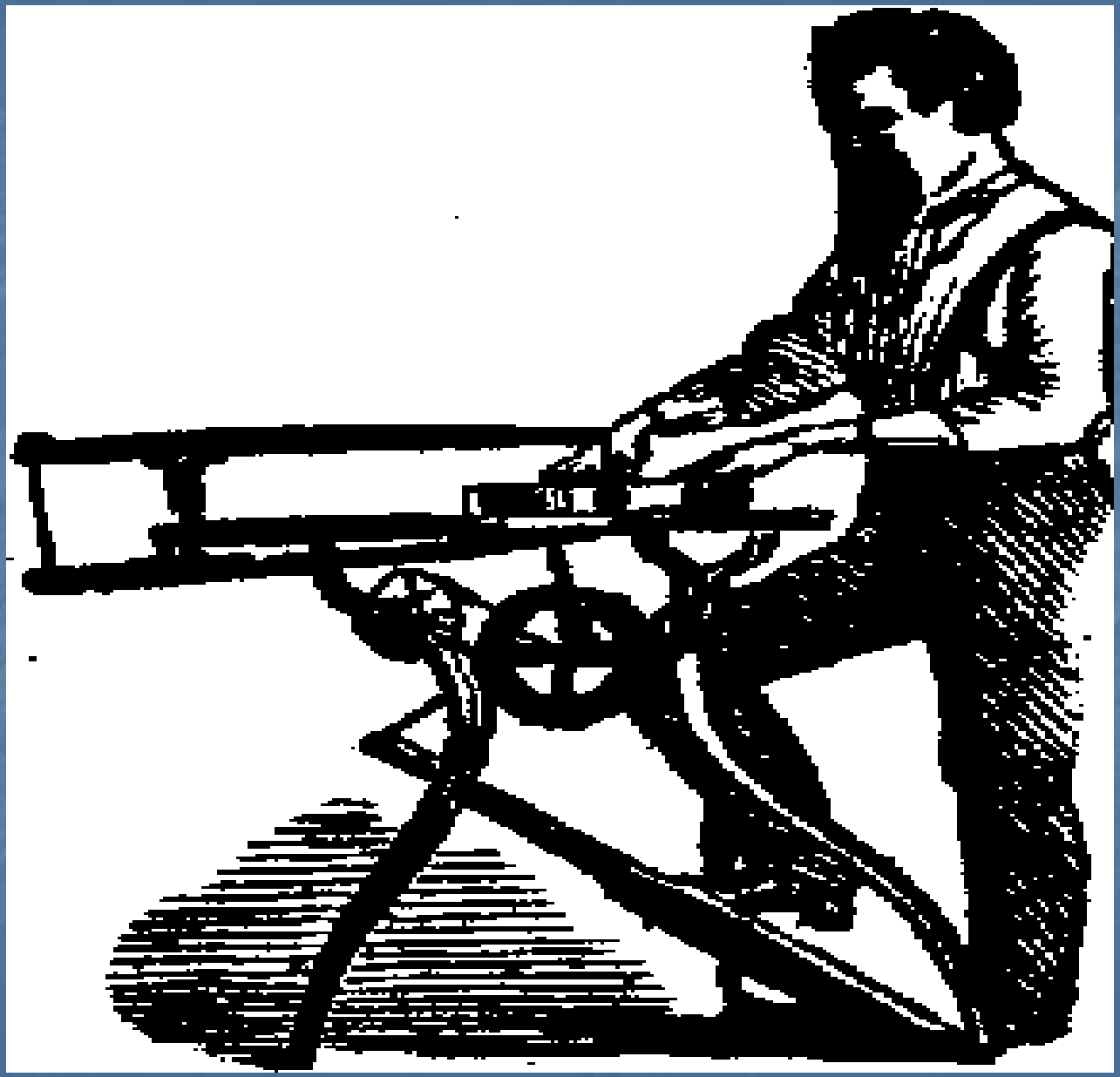
Ankle treadle with adjustable chair

Treatment Potential of a Footpower Lathe

Muscle Work and Mobilization

- Normal working of a lathe is directly re-educative for standing and walking and as a rule the patient should change legs at intervals. Both sexes enjoy turning and like the things they can make, while also subjectively appreciating the treatment as such.

  - Because part of the body weight is taken by the leg on the foot plate, the demands made on the hip abductors of the standing leg are less than those made when walking. Therefore a patient who must still walk with a stick, because of Trendelenburg weakness,



Compensatory Action

When there is limitation of knee flexion the following compensatory actions are common

1) The working foot may slide forward; a horizontal footstop can prevent this.

2) The patient will tend to compensate by bending the hip of the standing leg He should be told: 'brace your knee, tighten your seat muscle

3) There can be pelvic tilt and rotation as on the bicycle. Tell him to 'bend your knee forward and up'.

Adaptability

A standing block is sometimes useful in addition. This has the same effect as raising the bicycle saddle. It increases extension of hip and knee with corresponding decrease in flexion


Thank
You