

restriction of bone movement, in order to improve the range of motion in the joint (see Special Topic Fig. 9C).

## Importance of joint play

Just how vital joint play is to the body is made clear in the example given by Kuchera & Kuchera (1994), discussing the subtalar joint. This is a 'shock-absorber', a designation earned, they say, because 'in coordination with the intertarsal joints, it determines the distribution of forces upon the skeleton and soft tissues of the foot'.

Mennell (1964) graphically describes this shock-absorbing potential,

Its most important movement is a rocking movement of the talus upon the calcaneus, which is entirely independent of voluntary muscle action. It is this movement which takes up all the stresses and strains of stubbing the toes, and that spares the ankle from gross trauma, both on toe-off and at heel-strike, in the normal function of walking, and when abnormal stresses . . . are inflicted on the ankle joint. If it were not for the involuntary rocking motion at the subtalar joint, fracture dislocations would be more commonplace.

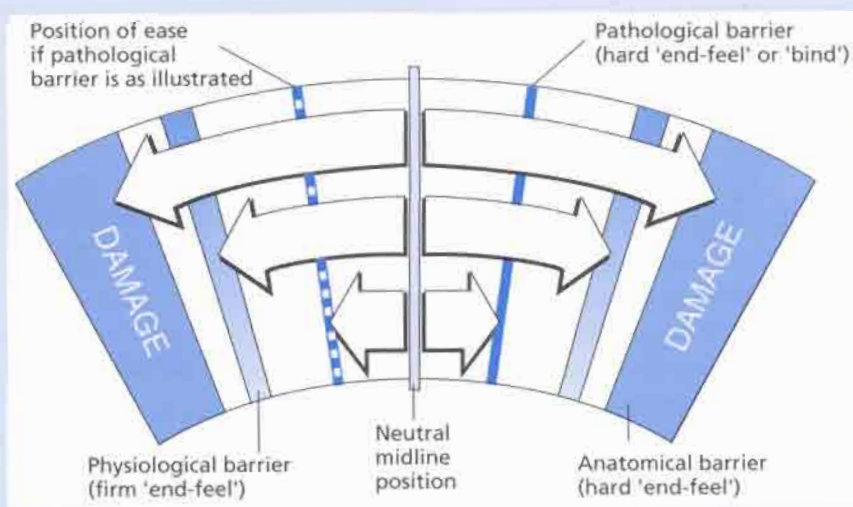
Similar shock-absorbing potential exists at the sacroiliac joint which, when this is lost as in cases where the joint has fused, can result in fractures of the sacrum (Greenman 1996).

## Barriers

All joints have 'normal' ranges of motion and some guidelines as to these are found in Chapter 9. Palpation should involve a screening of these for abnormal restriction or for hypermobility.

The end of a joint's range of motion may be described as having a certain feel and this is called 'end-feel'.

If a joint is taken actively or passively to its maximum range of normal motion it reaches its physiological barrier. This has a firm but not harsh end-feel. If this is taken to its absolute limit, the anatomical barrier is engaged and this has a hard end-feel, beyond which any movement would produce damage.



**Special Topic Fig. 9D** Schematic representation of a range of motion indicating normal restriction barriers (anatomical and physiological) as well as a pathological barrier and a position of maximal ease. The quality of the 'end-feel' of each of these will vary markedly.

**EXERCISE 5.16A: GOODRIDGE'S 'RESISTANCE' PALPATION****Time suggested: 5 minutes**

This palpation exercise evaluates the concept of 'ease and bind' during assessment of adductors of the thigh (see Fig. 5.24).

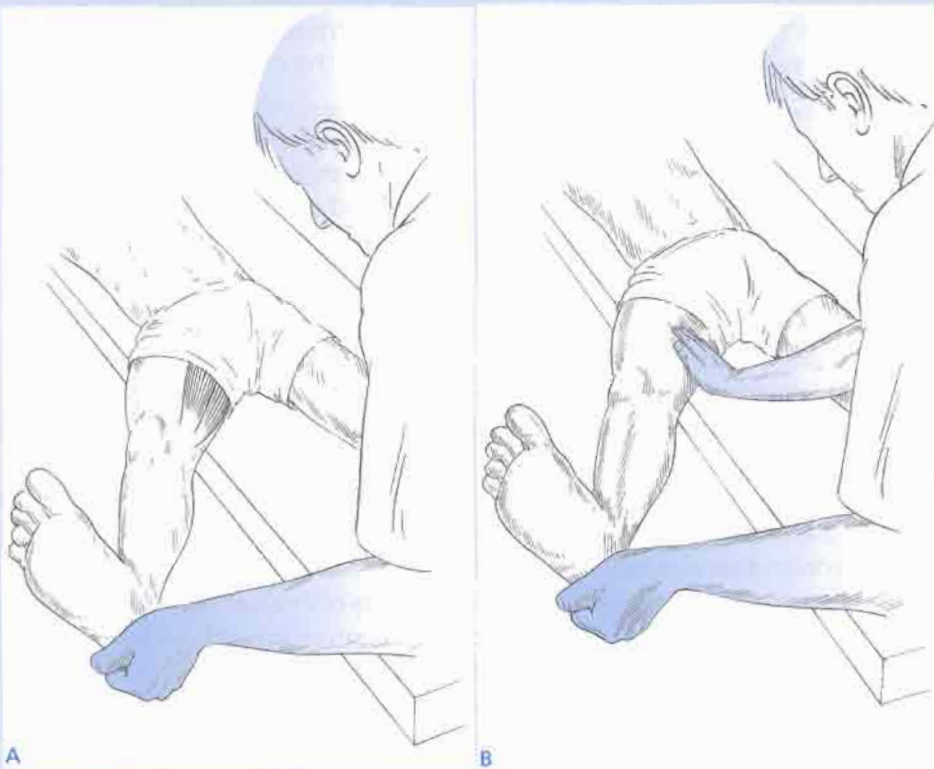
Before starting, ensure that your palpation partner lies supine, so that the non-tested leg is abducted slightly, heel over the end of the table. The leg to be tested is close to the edge of the table.

Ensure that the tested leg is in the anatomically correct position, knee in full extension and with no external rotation of the leg, which would negate the test.

After grasping the supine patient's foot and ankle, in order to abduct the lower limb, close your eyes during the abduction and feel, in your own body, from the hand through the forearm into the upper arm, the beginning of a sense of resistance. Stop when you feel it, open your eyes and note how many degrees in an arc the limb has travelled.

What Goodridge is trying to establish is that you learn to recognise the very beginning of the end of range of free movement, where easy motion ceases and effort begins. This 'barrier' is not a pathological one but represents the first sign of resistance, the place at which tissues require some degree of passive effort in order to move them.

This is also the place at which a sense of 'bind' should be palpated, in the next part of this exercise, below. It is suggested that the process be attempted several times, so that you get a sense of where resistance begins, before doing the next part of this exercise sequence. Then do the exercise again, but this time as described in Exercise 5.16B.



**Fig. 5.24A, B** Assessment of 'bind'/restriction barrier with the first sign of resistance in the adductors (medial hamstrings) of the right leg. (A) The practitioner's perception of the transition point, where easy movement alters to demand some degree of effort, is regarded as the barrier. (B) The barrier is identified when the palpating hand notes a sense of bind in tissues which were relaxed (at ease) up to that point.