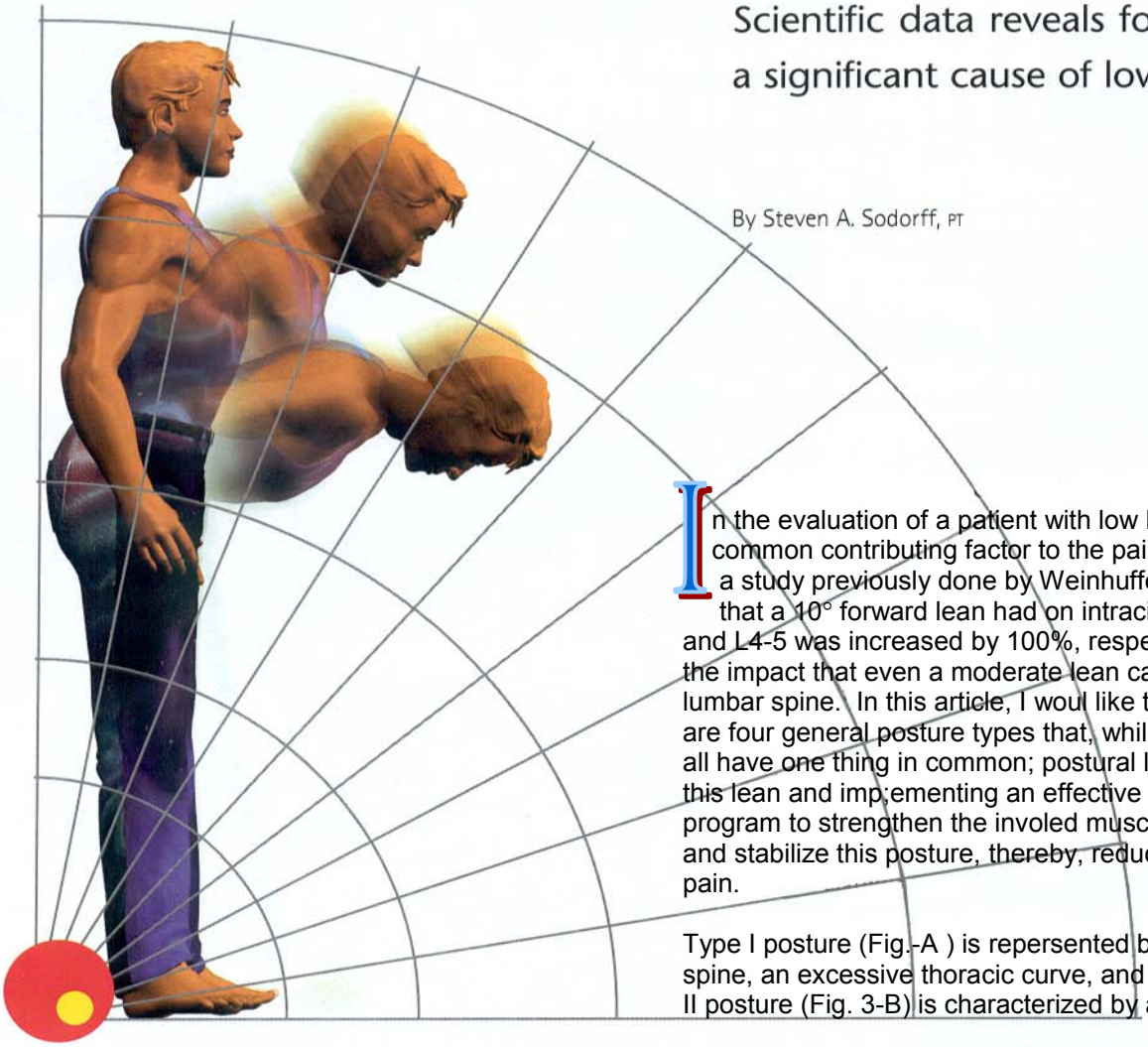
Posture Therapy

Posture Magazine
December 2002
Volume 1, Number 1

POSTURAL LEAN & PAIN



Scientific data reveals forward lean is a significant cause of low back pain

By Steven A. Sodorff, PT

In the evaluation of a patient with low back pain, the most common contributing factor to the pain is postural lean, In a study previously done by Weinhuffer et al [1], The effect that a 10° forward lean had on intraciscal pressure at L3-4 and L4-5 was increased by 100%, respectively. This shows the impact that even a moderate lean can have on the lumbar spine. In this article, I woul like tp propose that there are four general posture types that, while each one is unique, all have one thing in common; postural lean. By identifying this lean and imp;ementing an effective home exercise program to strengthen the involed muscles, we can correct and stabilize this posture, thereby, reducing any associated pain.

Type I posture (Fig.-A) is repersented by a flattened lumbar spine, an excessive thoracic curve, and a forward lean. Type II posture (Fig. 3-B) is characterized by an excessive lumbar

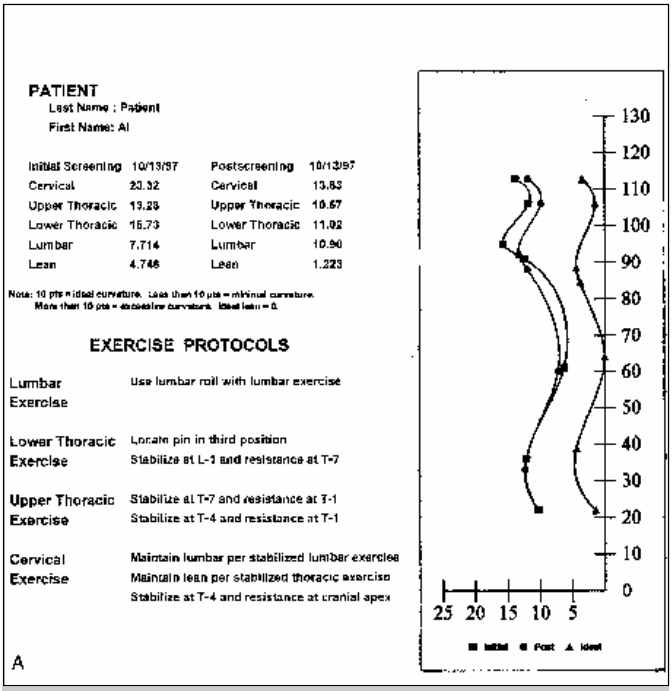


Fig 3 Posture Types. Any of these four types could have an excessive or flat cervical curve. Clinicians have found that a flat cervical curve show referral to wrist and arm impingement. An excessive cervical curve shows referral to upper thoracic shoulder and chronic headaches. Patients who experienced injuries in accident often have good posture. We have found these patient to be weak. A, Type I:Forward lean excessive upper thoracic curvature, and minimal curvature. (Courtesy of Pneumex, Inc. Sandpoint, ID)

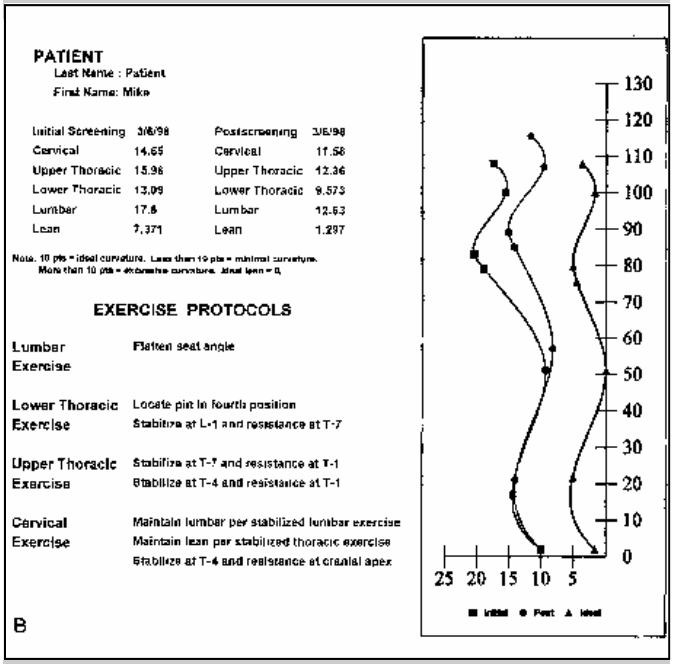


Figure 3 (continued). B, Type II: Forward lean and excessive lumbar curvature. (Courtesy of Pneumex, Inc. Sandpoint, ID)

curve and a forward lean. **Type III** posture (Fig. 3-C) is demonstrated by minimal thoracic and lumbar curves, and a normal or excessive forward lean. Finally, Type **IV** posture (Fig. 3-D) exhibits a reverse lean. Although three of the posture types are represented by forward lean, the Type IV posture demonstrates a reverse lean characterized by very poor paraspinal strength. Patients exhibiting this type of lean tend to "hang" on their hip flexors, performing a spinal balancing act. In general, they do not respond well to traditional modalities until the reverse lean is brought to neutral.

Now that the four posture types have been established, a treatment plan can be formulated for each. It is important that the position of the trunk, either anterior or posterior, is assessed, and the balance of the cervical, thoracic and lumbar spinal segments are also evaluated; therefore, the true spinal posture is considered when formulating a treatment plan. Upon proper evaluation, home exercises such as the ones below, can be established. The exercises suggested here are not all-inclusive, but should be very effective in a beginning home exercise program.

Type I: Hamstring stretch, Piriformis stretch, and standing & laying hyperextension.

Type II: Hamstring, Piriformis, and double knee stretch. Strengthening exercises include bridging and abdominal thrusts.

Type III: Type I exercises plus chin tucks.

Type IV: Hamstring stretch, Quadricep/hip flexor stretch, abdominal thrusts, and crunches with a gym ball.

Clinically, the correction and stabilization of postural lean in the treatment of low back pain greatly enhances the end result. Matching the patient with a specific posture type and treating accordingly with an exercise program designed for that posture will reduce rehabilitation time and facilitate a superior recovery with indefinite stabilization, as long as the patient maintains the home exercise program.

Through the use of the Pneumex Mapping'" (Fig. 1) system, we are able to quantify postural curves against normatIve data an identify postural deficiencies.

Fig 1 The Pneu-MAP (Courtesy of Pneumex, Inc. Sandpoint, ID)

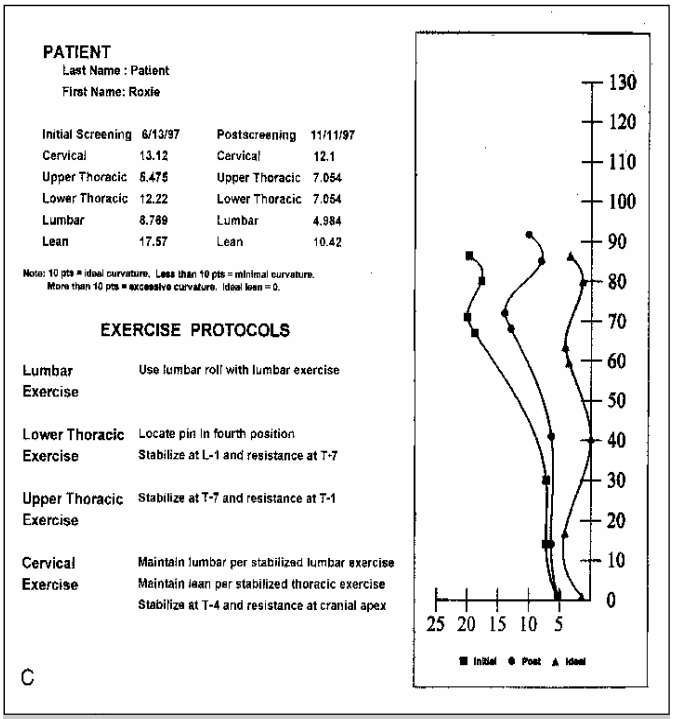


Figure 3 (continued). C, Type III: Normal or excessive forward lean and minimal thoracic curvature and minimal lumbar curvature. (Courtesy of Pneumex, Inc. Sandpoint, ID)

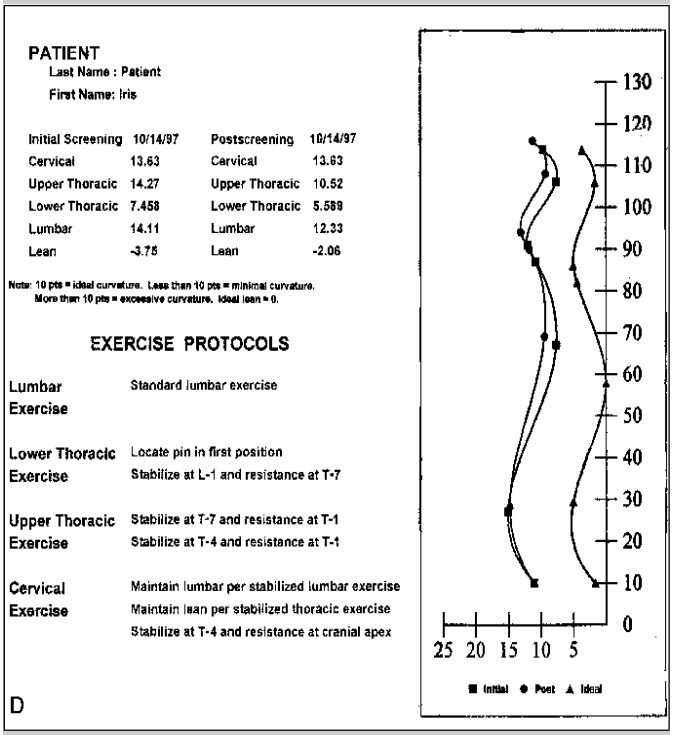


Figure 3 (continued). D, Type IV: Reverse lean .
(Courtesy of Pneumex, Inc. Sandpoint, ID)

The posture types are presented by the frequency of their appearance in the average population. The lean is determined by measuring the alignment of the cervical curve apex over the lumbar curve apex with 1cm of lean equal to approximately 1°. Our clinic, in cooperation with other clinics completed three screenings performed both in and out of the clinic. We utilized the same evaluation criteria, including a basic pain questionnaire. The lean threshold was established as 3° or greater being an excessive curve, causing a higher probability of low back pain. The results were as follows:

Screening 1: 69 Subject Population		
47 over 3'	38 (81%) indicated pain	9 (19%) asymptomatic
22 30 or less	5 (23%) indicated pain	17 (77%) asymptomatic
Screening 2: 242 Population		
193 over 3'	164 (85%) indicated pain	29 (15%) asymptomatic
49 3' or less	11 (22%) indicated pain	38 (78%) asymptomatic
Screening 3: 467 Patient Population		
367 over 3'	314 (86%) indicated pain	52 (14%) asymptomatic
91 30 or less	21 (23%) indicated pain	70 (77%) asymptomatic

Over 80% of the population screened who had a postural lean greater than 30 complained of low back pain. With the outcome of these screenings, and based on 10 years of functional outcomes, I feel a strong case can be made for targeting forward lean as a significant cause of low back pain.

References

1 Weinhuffer SI, Guyer R, Herberts M, et al: Intradiscal pressures above an instrumented fusion: A cadaveric study. Spine 20:526-31, 1995

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