Treatment of Lateral Curvature of the Spine.

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Cases of lateral curvature of the spine present such great variations that it is almost as difficult to lay down positive lines for treatment as it is to assign reasons for the curvature and for the rotation of the bodies of the vertebræ. The varying degrees of distortion and of rotation, moreover, demand close and special study, both of the requirements of a given case and of the results secured by any set of muscular movements. A careful survey of a hundred cases will show that the deviations in the curves of the spine, and in the other bony distortions, are almost infinite. Two curvatures in the same region and of apparently the same degree give entirely different results as regards the position of shoulders, the rotation of the scapulæ, the deformity of ribs, and the twist of the pelvis. The first element in treatment, therefore, and the one most neglected perhaps, is close observation of the nude back, and the effect of various motions upon the vertebræ and ribs; oftentimes, too, a front view is desirable. In young children the whole body should be stripped.

Differences in length of limb and tilt of pelvis should be mechanically corrected. False habits of sitting, standing, and working should be overcome. The life of the individual should be placed upon a definite and healthful basis, and the axiom that the co-operative efforts of the patient are all-important for success must be inculcated. Cure, in fact, lies in the hands of the individual, under the direction of the surgeon and the physical instructor.

As many of these cases are or have been rachitic, and as nearly all have lax ligaments and relaxed muscles, attempts should be made to restore muscular equilibrium. No brace, it is obvious, can accomplish this; it is, therefore, worse than useless as a corrective measure. Apparatus may sometimes be necessary to assist in the prevention of a rapidly increasing curve, or for the comfortable support of an old and hopeless curvature and rotation, but it is not a part of the proper treatment. Apparatus has a place, but a limited one, in the correction of this deformity.

After long experience in the management of these cases, at the offices and at their homes, both personally and through a physical instructor, I found that to maintain the interest of these patients in their work, and to prevent the exercises from becoming a drudge and an unpleasant duty, it was necessary that there should be a large variety of exercises to allow variation from day to day. As this cannot be secured in private homes I fitted out at the Hospital of the University of Pennsylvania a special gymnasium, with forty or fifty different appliances helpful for special muscular development. The results of a test of several years have been more satisfactory even than I expected. A prescription for each case is carefully made after several examinations, and all the work is done under the supervision of the surgeon and an instructor. For young children the element of play must be considered, and for them spring and hand propelled swings are valuable. These are also available in any private house or on a porch, the latter needing only a pair of turned hand-pieces sliding up and down upon the ropes, these hand-pieces being attached to a fixed point or arm a foot in advance of the suspension points of the swing. For home use also for young children, musical dumb-bells, return hand- and foot-balls, balance boards and spring boards, are of service, in addition to punch-balls, light dumb-bells, clubs, wands, wooden guns, and similar apparatus. Only rarely do I use heavy dumb-bells.

The best voluntary corrective position obtainable by the key-note position of the patient's arms and trunk having been ascertained flexions of the body both forward and backward are greatly desirable. With the arms thus placed, rotations of the vertebræ upon their long axes, either to right or to left as may be found helpful in each case, should also be practised. Rotations in the long axis of the vertebræ with the body flexed at right angles to the legs should also be employed in this key-note position. In the same position, also, there should be rotations of the body from side to side. It is very important that the backward flexibility of the dorsal portion of the spine should receive attention. In the position of hyperextension with hands clasped behind the neck, lateral backward movements are very helpful, as are also rotations and leg movements. Care should be taken that the patient does not simply lordose the lumbar region. This backward flexion can be more forcibly accomplished by supporting the projecting ribs on the side of the convexity with a fulcrum or padded roll, or with a webbing strap, which saves the strength of the instructor. In all dorsal lateral curves the muscles on the side of the concavity of the curve should receive at least one-third more work than those on the side of the convexity; for this purpose a trapeze with two bars, one above the other, should be employed; also swinging rings of uneven heights.

A large proportion of the movements should be voluntary, but the supervision of the surgeon

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