Muscular Fitness and Health

by HANS KRAUS, M.D., and RUTH P. HIRSCHLAND

Institute of Physical Medicine and Rehabilitation
New York University-Bellevue Medical Center

ACCORDING TO a Report of the National Conference on Physical Education for Children of Elementary School Age (1), every child needs at least a minimum of muscular strength and flexibility.

How many of our children do accomplish this goal? What is the minimum of strength and flexibility necessary for health? *In our studies of the muscular fitness of American school children in northeastern urban and suburban communities (13), we reported that 56.6 per cent between the ages of six and nineteen failed to meet even a minimum standard required for health.*

Too little attention has been paid to the fact that the dropping of physical fitness—more specifically, muscular fitness—below a certain minimum, actually jeopardizes well-being and health.

This is a condensation of an article. Anyone wishing a copy of the complete article may have it on request. Write Hans Kraus, M.D., 30 Central Park South, New York 19, N. Y.

Backache a Result

The fact that such needs of muscular fitness exist has been impressed on us incidentally, in the observation of a very frequent orthopedic disability: backache.

There are a very large group of backache sufferers who do not fall into any of the accepted categories of well-defined diagnostic entities. All conventional physical examinations are negative. However, if these patients are put through a number of simple tests for trunk muscle strength and flexibility, they fail in one or more.

We have tried to evaluate and grade deficiencies in this group of muscularly deficient backs in order to gauge the progress of our treatments and in order to empirically establish levels of minimum muscular fitness. Over 4,000 back cases were studied from this point of view, and the following test movements were used (2, 3, 4, 5, 8, 9, 10, 12, 14, 15, 16, 19, 23):

Test Movements

The patient was placed face down, hips resting on a pillow, hands locked behind the neck. The examiner held down the legs and hips and asked the patient to raise his trunk and to keep the trunk raised for ten seconds. Following this, the trunk and hips were held down and the patient was asked to raise the lower extremities simultaneously and hold this position for ten seconds. Findings were graded from one to ten seconds, depending on the patient, and noted as "upper back muscle strength" and "lower back muscle strength."

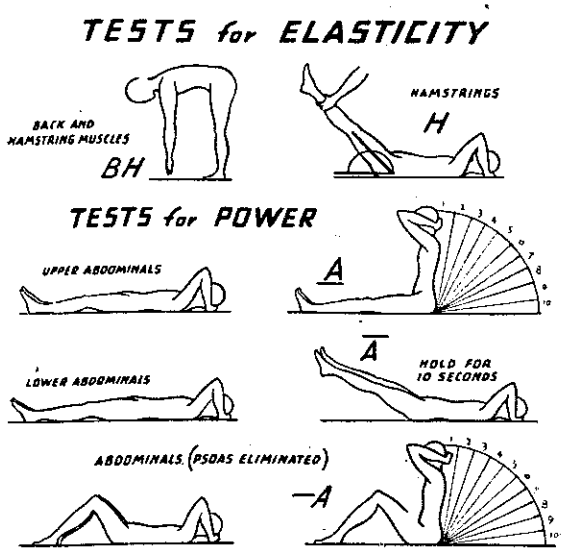
The patient was then placed in a supine position with his hands locked behind his neck. While his ankles were held down, he was asked to raise his trunk to a sitting position. Ability to do so unassisted was rated as 10, and depending on the degree to which the patient needed assistance, his rating was made accordingly. This gave the rating of the "upper abdominals."

Following this, the patient was asked to raise both legs to a 30° angle and to hold them for ten seconds with the knees straight. This gave the rating for the "lower abdominals," depending on the time the patient could hold up both legs. The patient was again asked to sit up from a supine position with his hands locked behind his neck and ankles held down, but this time with the knees flexed.

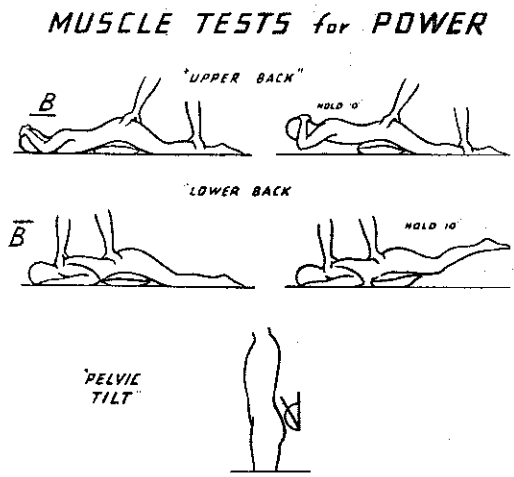
Then the flexibility of back muscles and hamstring muscles was determined. Back muscles and hamstring muscles were combined by having the patient try to touch the floor with the tips of his fingers, knees kept straight, and measuring the distance from the fingers to the floor. Floor touch was considered normal (t), and the distance from fingertips to floor was noted in inches.

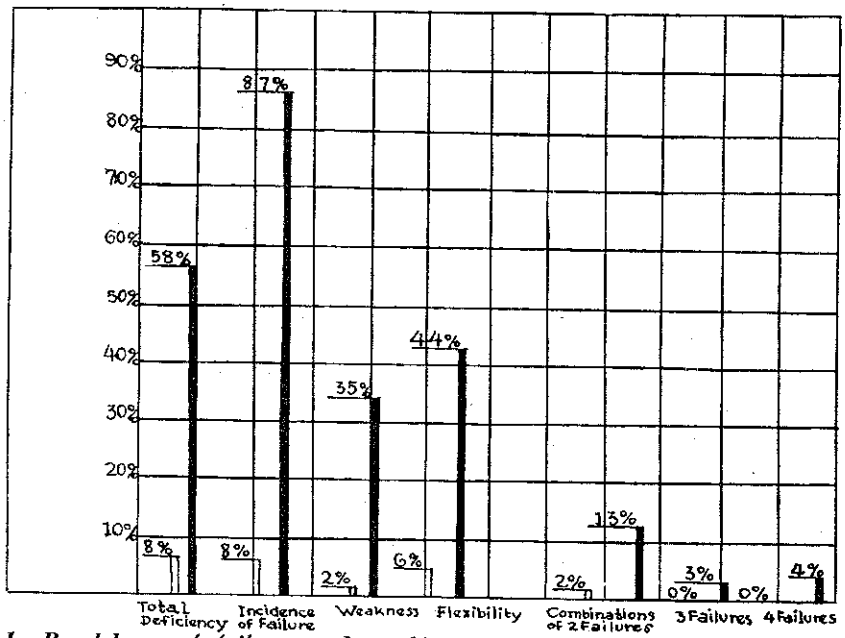
Improvement with Training

A good percentage of the patients unable to perform the tests improved as their strength and flexibility increased with systematic muscle training. The final outcome and the permanency of relief ran largely parallel with the muscle status. The patients recuperated as their muscles improved. They lost ground as their

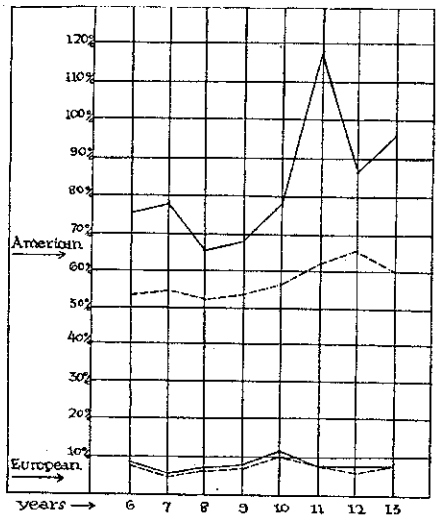


Over 4,000 back cases were tested





I. Breakdown of failures and combination of failures of American and European children of elementary-school age (6-13). American = ■■■■ European = ═══



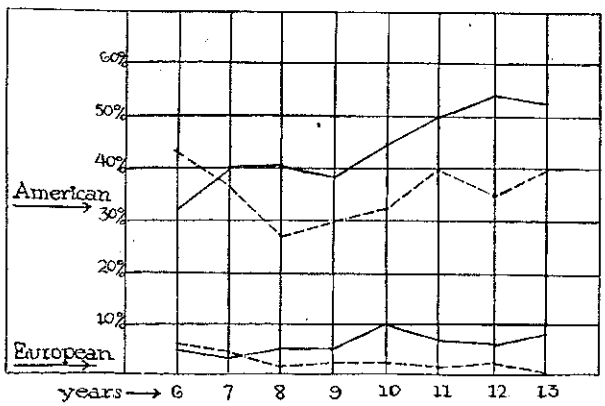
II. Comparisons of failure and incidence of failure of American and European children of elementary-school age (6-13). Incidence of failure = ———. children failing = - - - -.

physical activities were reduced or given up. The muscular fitness levels of these patients could be controlled by exercise.

As the percentage of adult backache sufferers in this country seemed very high in comparison with many other countries, it was thought that the examination of school children might throw some light on the causes for this condition.

Testing of Children

As mentioned before (13), 56 6 per cent of our children between the ages of 6 and 19 years failed to meet even a minimum standard required for health. We tested 4,458 normal, healthy school children between the ages of 6 and 19 years of age from suburban and small urban communities. The identical tests as those used on muscularly deficient backache sufferers were used, and 56.6 per cent of the children failed one or more of the tests. The incidence of failure, or the total number of tests failed, amounted to 78.3 per cent. This meant that 16 4 per cent were failing two or more of the tests.



III. Total weakness as well as flexibility failures of American and European girls and boys (6-13). Flexibility = ———; weakness = - - - - -.

It was further decided to test school children in countries other than our own in order to make some comparisons, and 1,987 European children from Italy and Austria were then tested. Every effort was made to keep test conditions identical with those in the United States. The resulting failure of 8 per cent and incidence of failure of 8.3 per cent made us feel that the tests were indeed well within the reach of healthy, normal people.

Findings

Graph I concerns our findings on children of elementary school ages (6 to 13).

In our efforts to determine the age at which this muscle deficiency first becomes apparent, we were met with a distressing fact: the children coming into the first grades of the school system are already seriously deficient. (See Graph II.)

It further appears that we are not able to alleviate the situation during the time the children are in the elementary schools. They leave in very much the same condition in which they entered — if anything, slightly worse.

Weakness as well as flexibility failures show that at no time do American statistics approach the fitness levels of the European. (Graph III.)

Why?

The major difference between these two groups is the fact that the European children do not have the benefit of a highly mechanized society; they do not use cars, school buses, elevators or any other labor-saving devices. They must walk everywhere. Their recreation is largely based on the active use of their own bodies.

Conclusions

We have the impression that insufficient exercise may cause the dropping of muscle efficiency levels below that minimum necessary for daily living. The same lack of exercise may cause inadequate outlet for nervous tension.

Lack of sufficient exercise, therefore, constitutes a serious deficiency comparable with vitamin deficiency. Prevention of this deficiency is an urgent need.

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Further research will be necessary to complete and broaden our preliminary survey and to show the geographical incidence of underexercise in this country. We may well find large sections where excellent conditions of muscular fitness prevail.

Our physical education needs a very definite expansion and active participation on a wider base, not only in high schools, but even more important, in elementary schools.

Muscular fitness tests should be a part of every school health examination.

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