

Neck and Shoulder Machine . . . Rotary Neck Machine . . . 4-Way Neck Machine

## ***INCREASING NECK STRENGTH . . . FOR THE PREVENTION OF INJURY***

*by Arthur Jones*

Neck injuries are the most common cause of death in football . . . but the number of fatal accidents comes nowhere close to indicating the actual extent of the problem. A far larger number of football players are injured to an important but lesser degree. One recent study stated that approximately ninety percent of all football players who are engaged in the sport for a period of several years will sustain permanent damage to the neck.

Injuries to the neck will continue to occur so long as football is played, regardless of what steps are taken in the direction of protective measures . . . but simple logic makes it obvious that a stronger neck is less likely to be injured in any given situation. So increasing the muscular strength and size of the neck is a long step in the direction of safety.

Unfortunately, until recently, no really practical method existed for exercising the muscles of the neck;

but that is a problem that no longer exists . . . simple, practical and very productive equipment now exists for the rapid development of all of the important muscular structures of the neck.

During a recently conducted research program, eighteen subjects increased the carefully measured strength of their necks an average of 91.92 percent in a period of exactly six weeks . . . as a result of only twelve neck workouts of approximately eight minutes each.

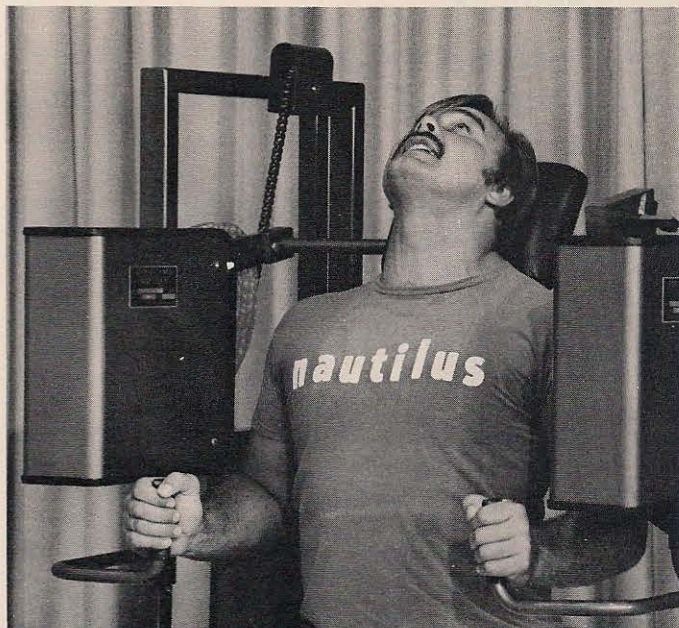
These subjects were first trained on three new types of neck machines for a period of two weeks, and the progress produced during this initial two-week period was not recorded. Then, at the start of their third week of training, all subjects had their neck strength carefully measured on a tensiometer. Neck strength was measured in four directions; to the front, the rear, and to both sides . . . and the total of the four resulting figures was used as a starting score.

Then, exactly six weeks and twelve workouts later, the subjects were again tested on the tensiometer in the same manner; the result being an average increase in neck strength for each of the eighteen subjects of 91.92 percent.

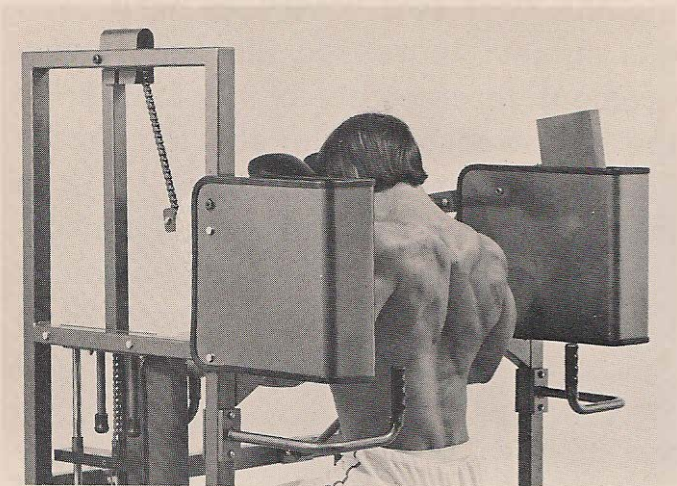
Since we did not test the subjects during the initial two weeks of training in order to avoid the so-called learning effect, it is impossible to say exactly what increase was produced during the entire eight weeks of training; but it was obvious to all observers that a large if unknown increase in neck strength occurred dur-

ing the first two weeks as well . . . one subject increased his neck measurement three-eighths of an inch from the first workout. Not the temporary increase of muscular "pump" but a permanent increase of actual muscular growth. Temporary muscular pump averaged well in excess of a full inch, and exceeded two inches in some cases.

These subjects trained only twice weekly, performing one set of each of seven exercises; utilizing three neck machines . . . a Nautilus 4-way neck machine . . . a Nautilus Rotary neck machine . . . and a Nautilus neck and shoulder machine. Which machines, in combination, provide proper full-range exercise for all seven functions of the neck muscles . . . (1) anterior flexion . . . (2) posterior extension . . . (3) lateral flexion to the right . . . (4) lateral flexion to the left . . . (5) rotation to the right . . . (6)



Dick Butkus demonstrates the posterior-extension exercise in a 4-Way Neck Machine.

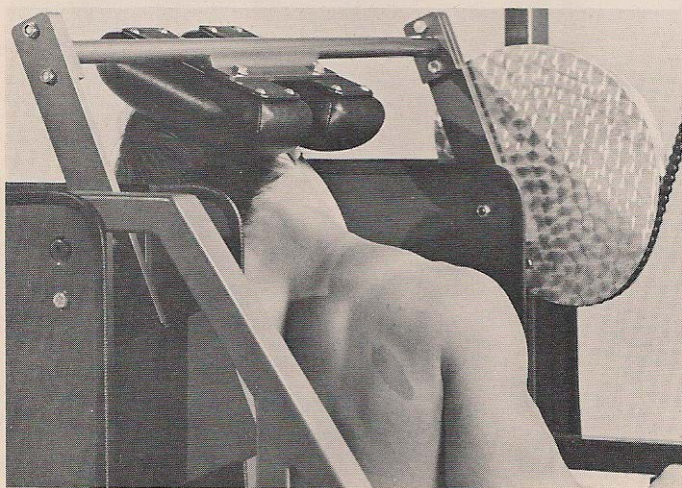


Anterior flexion exercise for the frontal neck muscles.

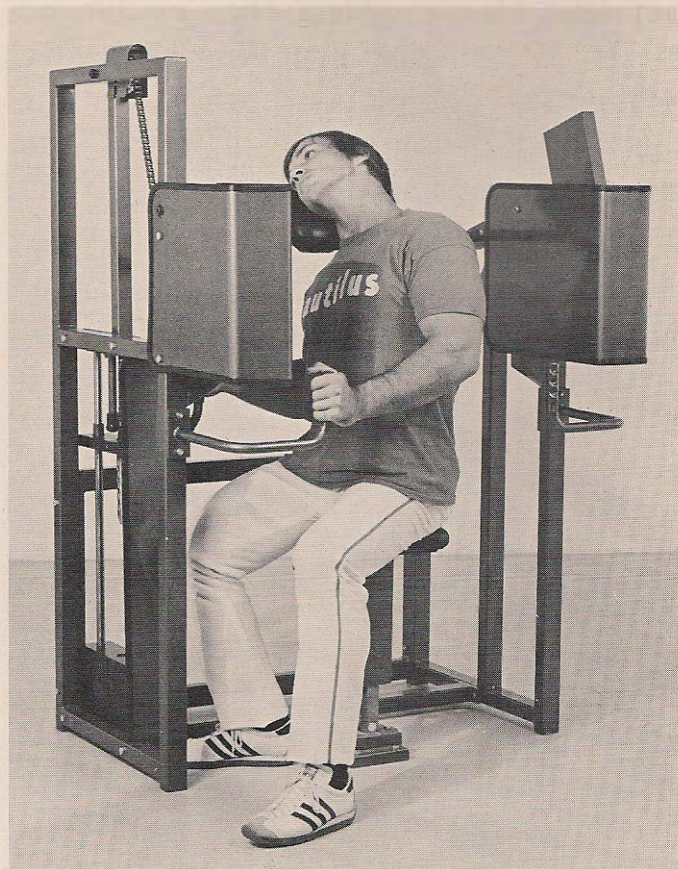
rotation to the left . . . and (7) elevation of the shoulders.

During each of the two weekly workouts, the subjects performed only one set of approximately twelve repetitions in each of five exercises, and one set of six repetitions in each of the other two exercises. The entire workouts averaging less than eight minutes.

The first exercise was a set of twelve repetitions of anterior flexion



The "pre-stretched" starting position of a lateral-flexion exercise.



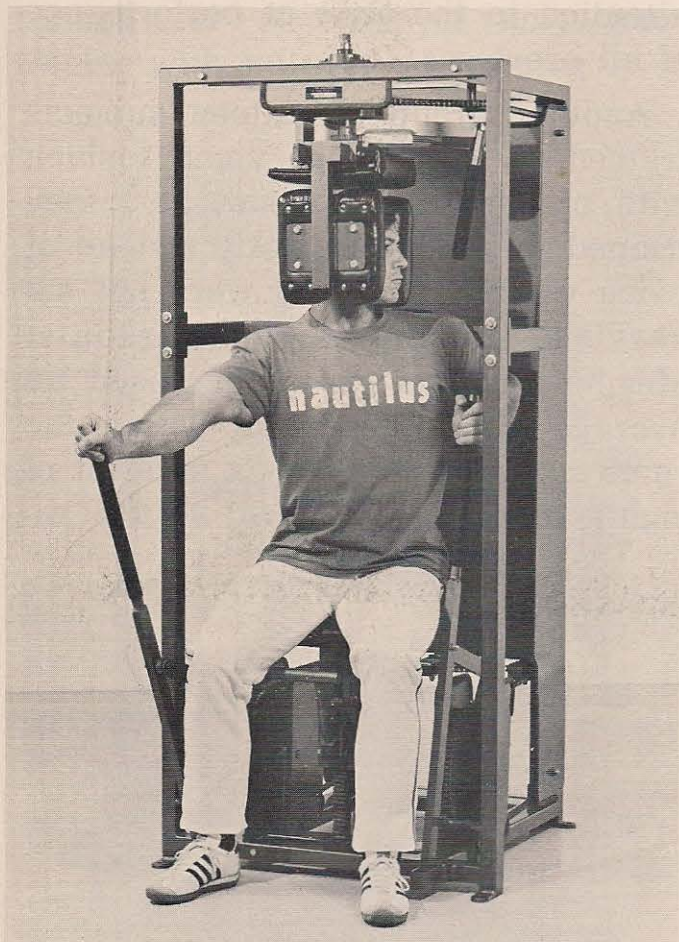
The fully contracted finishing position of a lateral-flexion exercise.

performed in a 4-way neck machine . . . immediately followed by a set of twelve repetitions of posterior extension in the same machine . . . followed by a set of twelve repetitions of lateral flexion to the right, still in the same machine . . . and then twelve repetitions of lateral flexion to the left, again in the same machine.

Having completed the first four exercises, all of which were performed in the 4-way neck machine, the subjects then moved immediately to the Rotary neck machine for the next two exercises . . . rotation to the right and rotation to the left. These two exercises were performed in a negative-only style and only six repetitions of each exercise were used.

The final exercise was one set of twelve repetitions performed in a Nautilus neck and shoulder machine.

During five of the seven exercises, the exceptions being the Rotary neck machine exercises, the work was done in a normal fashion involving both positive and negative work. The resistance was lifted by the action of the neck muscles in a smooth and steady fashion, with absolutely nothing in the way of sudden movement or jerking. Upon reaching the top position of full muscular contraction, the subjects paused and held that position for approximately one second . . . and then slowly and smoothly



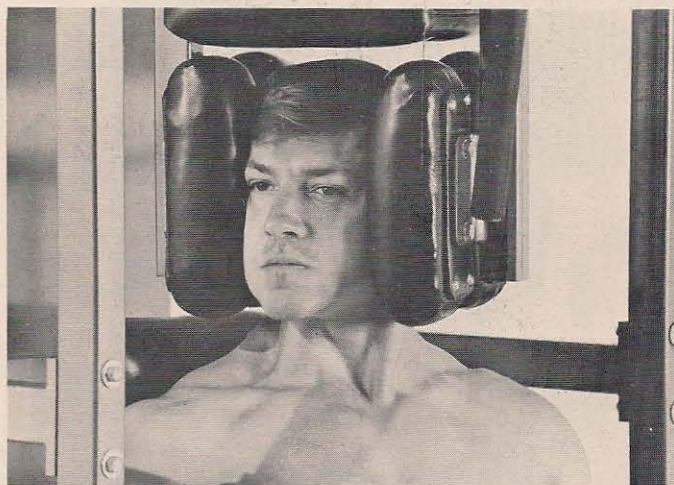
The Rotary Neck Machine provides full-range exercise for the rotational functions of the neck muscles.

lowered the weight back down to the starting position.

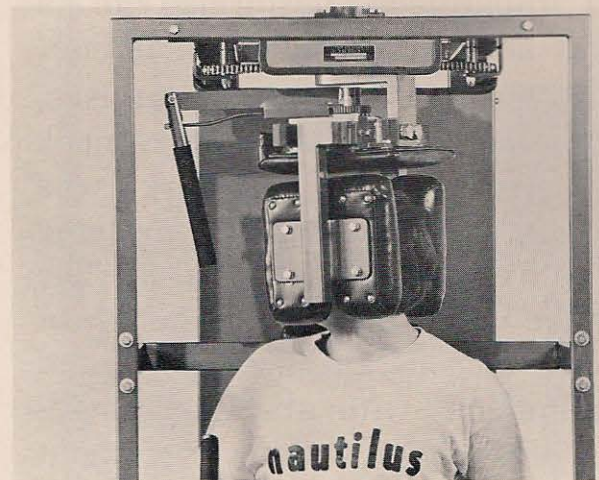
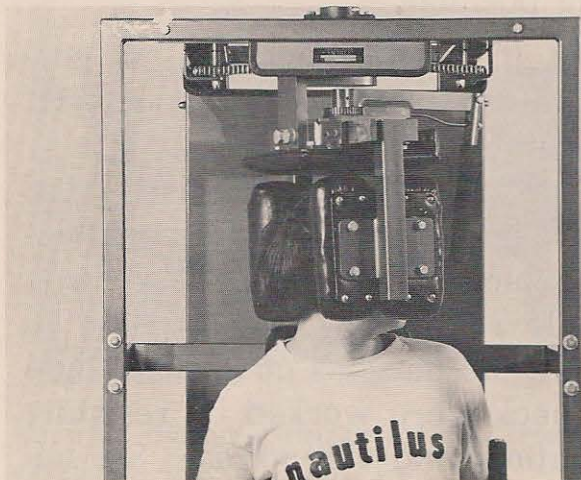
When it became possible to perform twelve repetitions in good form, the resistance was increased.

In the other two exercises, the work was performed in a negative-only fashion; while the head was forcefully rotated by the machine to the right, the muscles on the left side of the neck were worked by resisting the rotation, and vice versa. Six negative-only repetitions were performed in each direction, with a maximum possible level of resistance in all repetitions . . . an amount of resistance constantly regulated in exact accordance with the requirements of the moment.

Such a complete neck workout can easily be performed in five minutes or a bit less, but in practice the subjects usually required something more than seven minutes of elapsed time for a full neck workout; primarily because they usually did not move from one machine to the next as rap-



The adjustable pads grip the head firmly but comfortably.



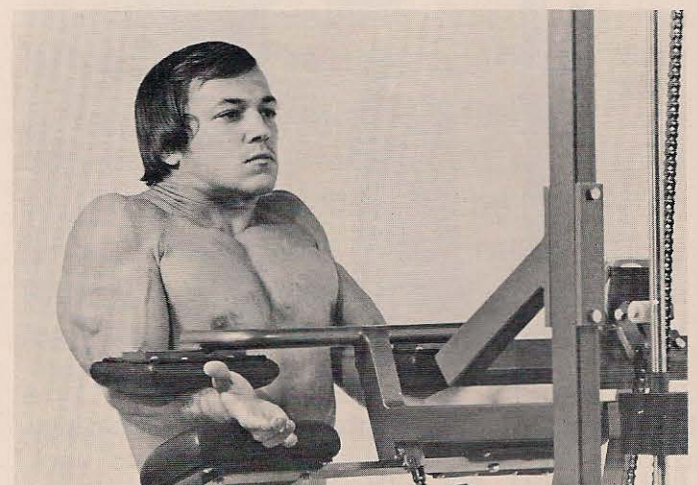
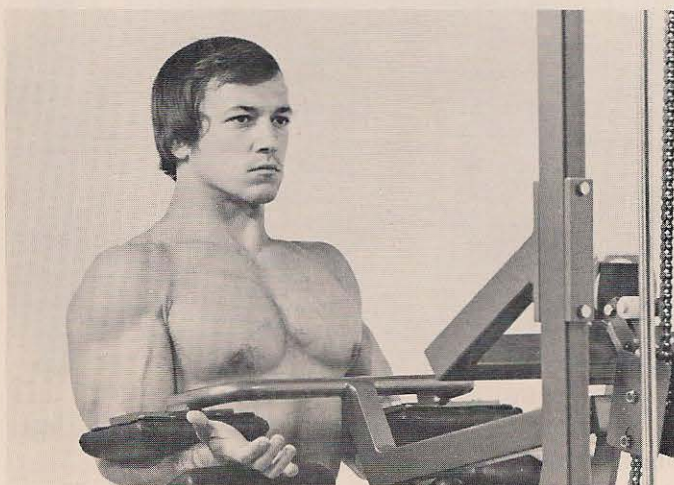
The Rotary Neck Machine provides a range of movement in excess of 180 degrees.

idly as they should. Thus it is easily possible to produce full development of all of the neck muscles as a result of only ten minutes of weekly training . . . but in practice you can expect an average subject to devote approximately fifteen minutes to such training weekly, two workouts of about seven and a half minutes each.

All of the above mentioned subjects trained under supervised conditions, and part of the resulting increases in neck strength should be attributed to

the supervision, which assured close attention to the style of performance of all exercises.

Another group of sixteen subjects trained in exactly the same fashion with only two exceptions . . . they trained three times weekly instead of twice weekly, and they were not supervised during their workouts. Members of this group increased an average of 56.72 percent within the same six weeks period, as a result of eighteen brief workouts. So the re-



The starting and finishing positions in a Neck and Shoulder Machine.

sults were very good even without supervision . . . and there is strong evidence to indicate that performing three weekly workouts instead of two actually reduced the resulting strength increases in this group.

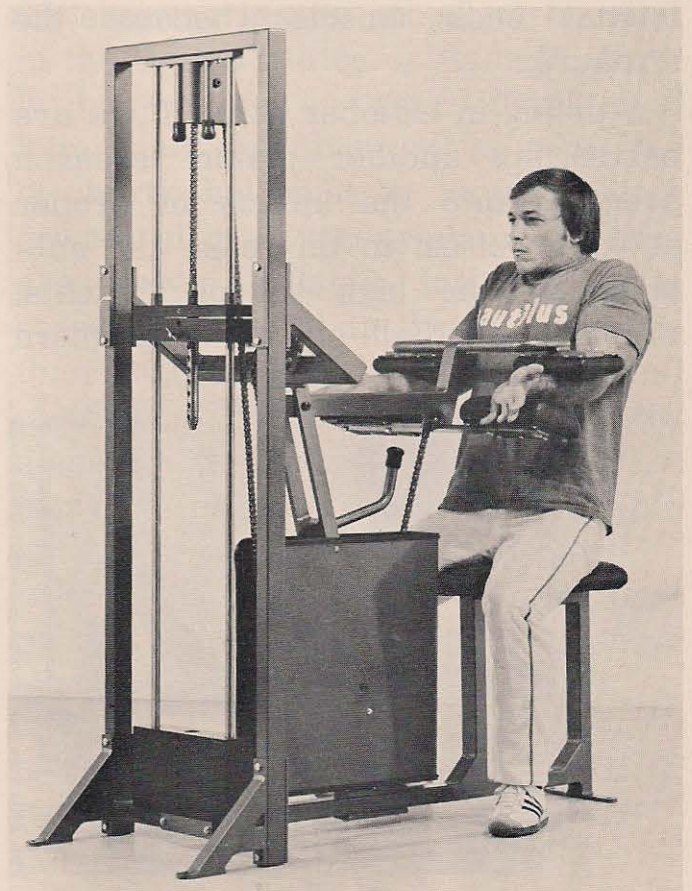
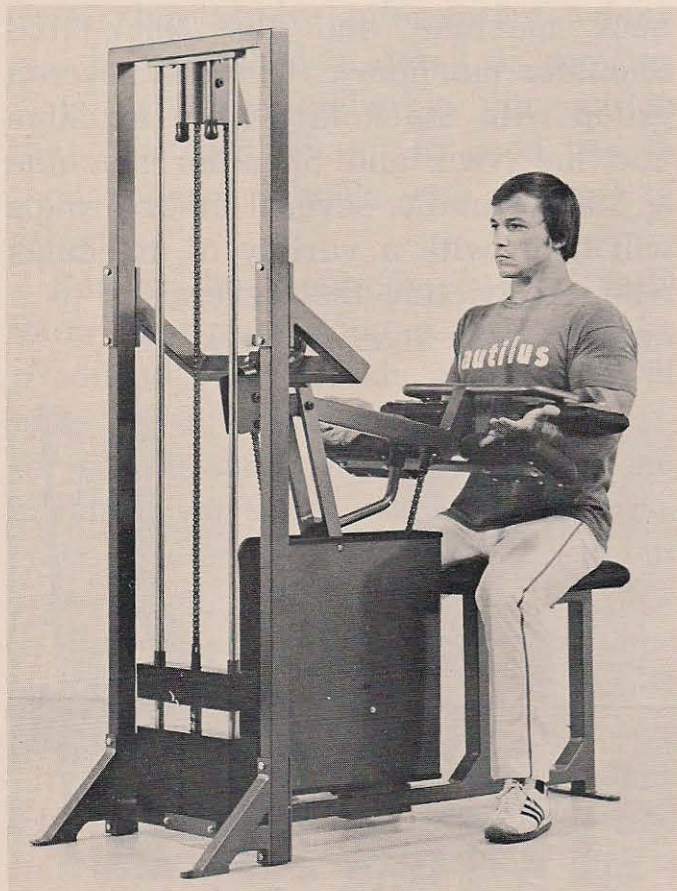
Because . . . two other groups of twelve subjects (twenty-four subjects altogether) also trained in an unsupervised fashion; with one group performing only two weekly workouts and the other group performing three weekly workouts . . . and the twice-a-week group actually produced somewhat better results.

In this comparison, both groups trained for a total of only four weeks, with no pre-test training . . .

so one group trained a total of only eight times, while the other group performed a total of twelve workouts. The twice-a-week group increased neck strength an average of 41.6 percent from only eight workouts . . . while the three-times-a-week group increased an average of 39.8 percent.

Thus the value of supervision is obvious, but it also appears that an extra, third weekly workout is of no value and may actually reduce the rate of strength increase.

At least one other result of this research program was also rather surprising; at the start of the program we knew that the weakest of the four neck-strength tests was the one that



The pre-stretched starting position and the fully contracted finishing position in a Neck and Shoulder Machine.

measured anterior flexion, the strength of the muscles of the front of the neck . . . and we also knew that the strongest was a measurement of posterior extension, measuring the strength of the muscles of the back of the neck.

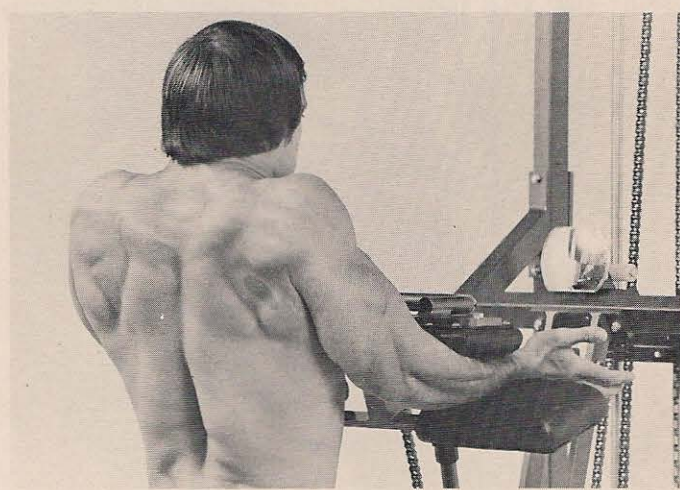
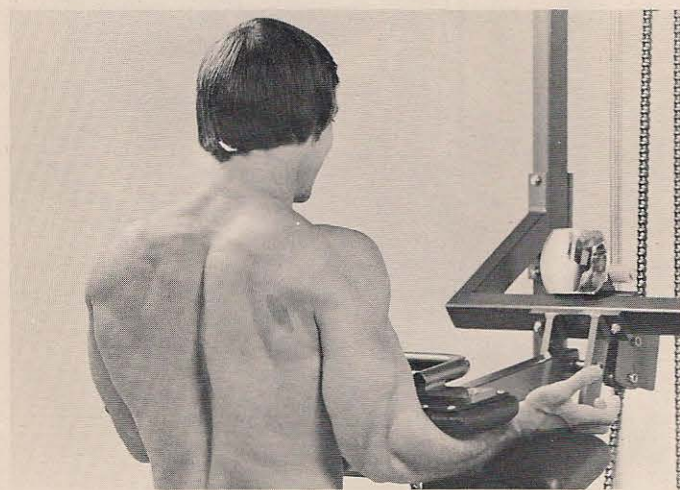
But this ratio of front to back strength changed during the course of the eight week program . . . the frontal neck muscles increased in strength at a faster rate than the other neck muscles, perhaps because they have been the most neglected of a generally neglected group of muscles. With a longer program of proper neck training, the author would not be surprised to see this ratio change to the extent that the frontal neck muscles become the strongest.

Starting in October of 1975, we are conducting another major research program into the effects of proper neck exercises; in this case the subjects will be high school students, primarily football players . . . there

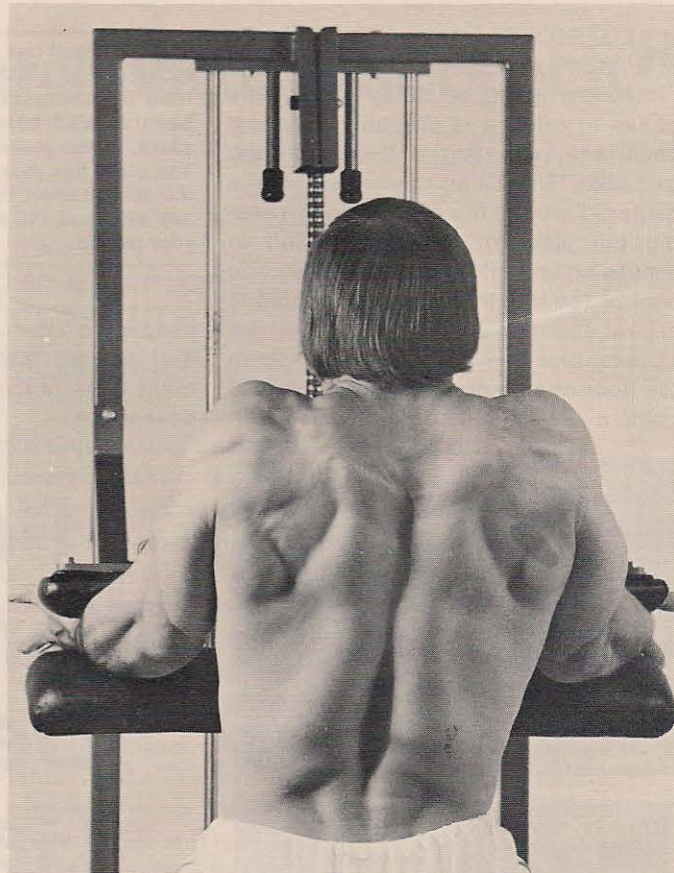
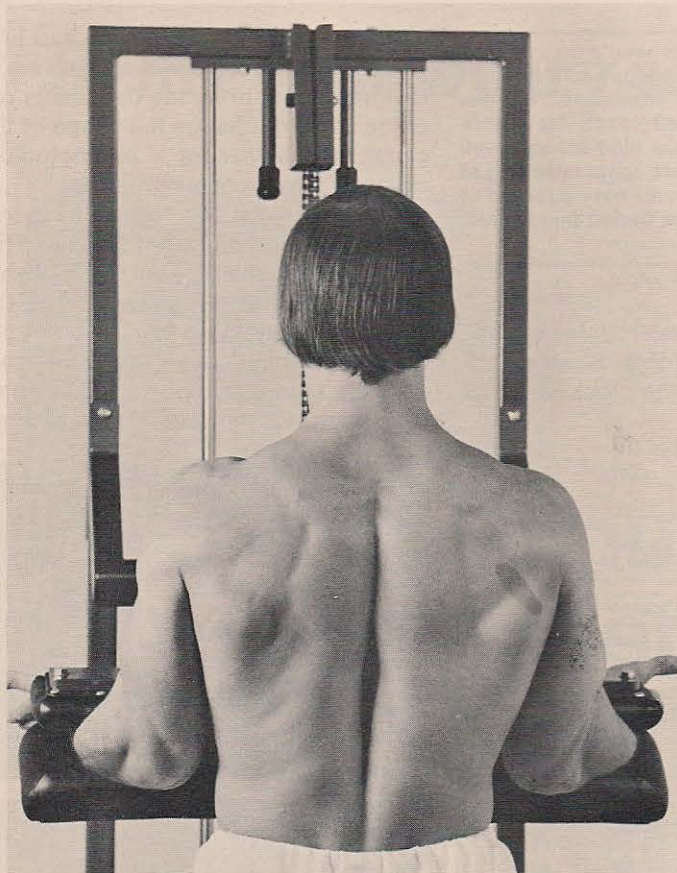
will be approximately 200 subjects and the study will run for a period of eight full months.

One large group will train exclusively with the 4-way neck machine . . . another equal sized group will train only with the Rotary neck machine . . . and a third group with only the Neck and Shoulder machine. After eight months of carefully supervised workouts with three large groups, we should be able to tell exactly what result is produced by each type of machine.

Additionally, a fourth group will train with all three machines . . . a fifth group with the 4-way neck machine and the Rotary neck machine . . . a sixth group with the 4-way neck machine and the Neck and Shoulder machine . . . and a seventh group with the Rotary neck machine and the Neck and Shoulder machine . . . and, finally, several other groups will train with a variety of machines while restricting their exercises to a negative-only style of work.



The four comfortable arm pads remove the involvement of the hands and arms in this exercise.



We expect to learn a great deal from this study, information which will be published in detail as soon as it is available; valuable information that can then be put to good use in thousands of schools with millions of athletes.

But in the meantime, we already know that very good results can be produced very quickly as a result of only two brief weekly workouts; better results will be produced with supervised workouts, but very good results can be produced even without supervision.

We feel so strongly about the need for proper development of neck strength as a safety factor that we have prepared a professional 16mm film on the subject . . . featuring and narrated by Dick Butkus, this film is approximately twenty minutes in length, with both color and sound.

Copies of this film can be obtained for showing in any school or hospital in the United States or Canada merely by writing on your institutional letterhead; the films will be sent free of charge but must be returned after a week of use. 100 prints of this film are now available for immediate screening . . . but there are more than 30,000 schools and an equal number of hospitals in this country alone, so the sooner you write for a print the quicker it will be available on a first come, first served basis.

Requests for the film or additional printed information on neck training should be sent to . . .

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