ASSISTED chins and dips

New exercise stations put the ability to handle body weight within the grasp of most exercisers.

By Matt Brzycki

CHINS AND DIPS are two basic, yet highly productive, movements that exercise every major muscle in your upper torso. Chins provide work for your upper-back region (lats), your biceps and much of your forearm musculature. Dips challenge the lower portion of your chest (pecs), the anterior portion of your shoulder and your triceps. In addition to affecting a rather large amount of muscle tissue, chins and dips are important exercises in promoting proprioceptive awareness since they both involve movement of a person's entire body mass.

Unfortunately, chins and dips can be very difficult, if not impossible, for much of the population to perform. In particular, youths, females and overweight individuals, due to insufficient strength, experience difficulty with these movements. Clearly, the task of the strength and fitness professional is to devise a progressive manner of training that will lead to the performance of these two useful exercises.

In the past, there were essentially two approaches used as a progression to chins and dips: producing similar movements that exercise the same muscles, and performing chin-ups and dips in a "negative-only," or eccentric, fashion. The problem is that neither of these techniques lead to the actual performance of chins and dips. As a result, several manufacturers have introduced machines that will, and they have become increasingly popular.

Chin-up/dip machines

In March, 1987, StairMaster Sports/Medical Products introduced the Gravitron 8000 — a device that assisted individuals to perform chins and dips with a pneumatic-powered platform. Once you had entered your body weight and the percent you wanted to lift, the machine allowed you to progressively increase your strength while you performed actual chins and dips with mechanical assistance.

In 1990 Cybex patented its Assist Dip/Chin machine which provided the assistance from a selectorized weight stack via a foot post lever. The user simply selects the amount of weight he or she wants for assistance and stands on the foot post before beginning the exercise.

In 1992, StairMaster introduced a simplified, lower-profile machine named the Gravitron 2000. The 2000 provides pin-selected weight-stack assistance and is lower because the lift platform provides indentations for the user to kneel, thus taking a couple of feet off the taller users' height. At about the same time, Nautilus introduced its weight-assisted chin/dip.

Last year, Universal Gym Equipment brought out the 6019 Assist Dip/Chin as part of its Power Circuit machine line. In keeping with that line's design, the 6019's weight stack is located at the side of the user. The side-drive lift mechanism, which has double levers and axle pivots to prevent torsional flexing, provides the desired assistance. The kind of lift assistance provided by each of these machines encourages progressive improvements in the contractile skills required to do the exercises with one's body weight.

Previous chin-up/dip techniques

Prior to the introduction of chin-up/dip machines, two techniques were used to imitate the performance of chin-up/dip exercises. In the first, for example, a lat pulldown or other pulling movement was recommended to influence the same muscles as chins, and a bench press or other pressing movement would be suggested to utilize the same muscles as dips. With these exercises, you could begin with a resistance that was sufficiently lower than your body weight. The resistance would then be increased gradually and systematically until, in theory, your muscular strength increased to a level that permitted you to perform chins and dips with your body weight.

Although this may seem like a logical solution to the problem, this practice didn't work. Why? The answer lies in a fundamental law of motor learning: the Principle of Specificity. This principle states

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that an activity must be specific to an intended movement in order to produce maximal improvement — or "carryover." *Specific* means "exact" or "identical," not "like" or "similar." So, lat pulldowns may be like chins, and bench presses may be similar to dips, but doing lat pulldowns and bench presses will only help you get better at doing lat pulldowns and bench presses. Quite simply, there's no carryover between the skill used to perform a lat pulldown and the skill used to do a chinning movement.

Doing chins and dips in a "negative-only," or eccentric, fashion didn't produce the same results as chin-up/dip exercises do either. The logic behind this recommendation has to do with the relationship between your concentric and eccentric levels of strength. Some research suggests that a fresh muscle can lower eccentrically about 40 percent more than it can raise concentrically. As such, even though you may not be strong enough to raise your body weight, there's a good possibility that your are able to lower your body weight. Furthermore, the same muscles used to raise a resistance concentrically are also used to lower it eccentrically. The difference is that when you raise a weight, your muscles are shortening against tension, and when you lower a weight, your muscles are lengthening against tension. So, chins and dips done in a negative-only manner (i.e., lowering your body weight) involve the very same muscles as chins and dips performed in a conventional style (i.e., raising and lowering your body weight). In theory, as your eccentric strength increases by a certain percentage, your concentric strength will also increase by that same percentage.

In the case of a chin, a negative-only repetition is done by stepping or climbing up to the mid-range position of the movement (i.e., your chin is over the bar) and then lowering yourself under control in about six to eight seconds to the stretched position (i.e., your arms are fully extended). You would then repeat this procedure for a prescribed number of repetitions.

Although it was a step in the right direction, this method did not always lead directly to the performance of chins and dips. Once again, the reason pertained to the Principle of Specificity. Remember, an activity must be specific or identical to an intended movement in order to stimulate maximal improvement. In this case, lowering your body weight will have a marked improvement on your ability to lower your body weight.

Though lowering your body weight is quite similar to raising your body weight, the two activities are not identical and, in fact, involve different neuromuscular patterns and contractile skills.

The exercises

Regardless of whether you're doing chins and dips with assistance, with your body weight or with resistance, there are a few general practices you should follow to maximize response. It should take about one to two seconds to raise your body and about three to four seconds to lower it. In effect, each rep should last approximately four to six seconds.

Chins and dips should be performed for about eight to 12 repetitions. Once 12 repetitions can be performed with good technique, you should reduce the amount of assistance or, if you're already able to perform chins and dips with your body weight, you should increase the amount of resistance (by adding extra weight to your body).

Here's some specific guidelines for performing these two exercises:

Chins. To begin the exercise, reach up and grasp the bar with your palms facing you. Your hands should be spaced approximately shoulder width apart. Lift your feet off the floor and cross your ankles. To perform the exercise, pull yourself up so that your upper chest touches the bar and your elbows are rotated backward. Pause briefly in this position, then lower yourself back to the starting position (arms fully extended) at the end of each rep to provide a proper stretch. You can also space your hands several inches wider than shoulder width apart with your palms down. In this case, you can either pull yourself up so that the bar touches either your upper chest or behind your head and your elbows are drawn to your side. (This is typically referred to as a "pullup.")

A hand up from the chin/dip machine has won the favor of fitness exercisers.

Performing this movement with an overhand grip (palms down) is not as efficient as performing it with an underhand grip (palms up). With an underhand grip, your forearm bones — the radius and ulna — run parallel to one another. With an overhand grip, your radius pivots near your elbow and crosses over your ulna forming an "X." When this happens, your bicep tendon wraps around your radius, creating a biomechanical disadvantage. Quite simply, you lose leverage.

One other note: More and more rehabilitative professionals (i.e., physical therapists, athletic trainers) are advising not to do lat pulldowns or pullups behind-the-head with an overhand grip. Their reasoning is that when the bar is pulled behind the head, it places the shoulder joint in a vulnerable position and may aggravate or contribute to "Shoulder Impingement Syndrome." This is a collective term used to describe a general tightness or pinching in the shoulder region.

Dips. To begin the exercise, grasp the handles and assume a stretched position with your knees slightly bent and your ankles crossed. To perform the exercise, raise your body upward by extending your arms. (Don't lock or "snap" your elbows in this position. Doing so takes the tension off your muscles and may hyperextend your elbows.) Pause briefly in this position and then lower yourself back to the starting position (elbows bent about 90 degrees) at the end of every rep to ensure a proper stretch. ❑